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TRANSACTIONS

OF THE

MICHIGAN

STATE MEDICAL SOCIETY

FOR THE YEAR 1880.

NO. IV.—VOL. VII.

LANSING:
W. S. GEORGE & CO., JOB AND BOOK PRINTERS.
1880.

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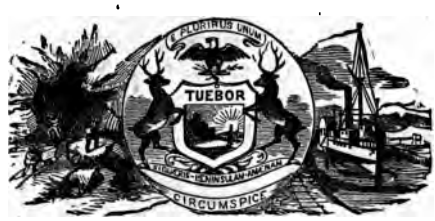


NO. IV.—VOL. VII.

LANSING:
W. S. GEORGE & CO., PRINTERS AND BINDERS.
1880.

PREFACE.

The author is afforded this medium through which to reach the public; but the Society, in directing a publication, must not be understood as indorsing the views or opinions expressed in it; and while they invite candid criticism, they deprecate any other.

FIFTEENTH ANNUAL MEETING AND FOURTEENTH ANNUAL REPORT

OF THE

MICHIGAN STATE MEDICAL SOCIETY.

First Day—Morning Session.

The fifteenth annual meeting of the Michigan State Medical Society was opened on Wednesday, May 12, 1880, at 10 o'clock A. M., in the U. S. Supreme Court room, in Grand Rapids, and was called to order by the President, Dr. G. K. Johnson, and prayer was offered by Rev. J. Morgan Smith, of that city.

Dr. J. O. Eddie, member of the Executive Committee, welcomed the Society, in a few appropriate remarks, to the hospitalities of the physicians and citizens of the Valley City.

The roll was then called by the Secretary, when a large number of members responded to their names.

The Executive Committee reported a programme for the entire meeting, and gave notice that cards of invitation to receptions to be given the Society by Dr. and Mrs. G. K. Johnson, and Mr. and Mrs. F. B. Gilbert, on Wednesday evening, would be distributed to the members of the Society and their ladies in attendance.

Several proposals for membership were then made and referred to the Committee on Admissions.

Dr. Brodie said that there had been talk by members of this Society of making the Society a delegated body, as it was thought by some that the profession of the State was sufficiently advanced in their organizations, and the State suffi-

ciently populated and accommodated by railroads and other means of conveyance, to make such an end desirable and practicable; and he submitted the question if it would not be best to appoint a committee to take this matter into consideration and report upon it.

A member asked how many local societies were in communication with the State Society; to which the Secretary replied that he thought there were about twenty-three.

Dr. Bingham, of Brighton, then moved that a committee of five be appointed to consider the matter of reorganization into a delegate body, and give their views upon the subject in a full report at the next meeting.

Adopted.

The Secretary then read the credentials of Prof. S. G. Jones as delegate from the Illinois State Medical Society, and on motion of Dr. Brodie, Dr. Jones was invited to a seat on the platform.

The Secretary then read the following communication:

DETROIT, *May 3, 1880.*

To the President and Members of the Mich. State Medical Society:

RESPECTED SIRS:—In view of the acknowledged increasing evils resulting from the use of alcoholic liquors, we, as representatives of the Women's Christian Temperance Union, do most respectfully ask the consideration by your association of the following questions:

1. Is the use of alcoholic liquors an absolute necessity in the practice of medicine?

2. Is not their prescription in great danger, not only of resulting in their *self-prescribed* use as a medicine, but also of fostering a habit of their use as a beverage?

3. Is not the danger of their use as a medicine, resulting in their abuse as a beverage, so great as to demand from the medical profession the utmost care in their use?

4. Is the use of beer as a tonic, either in sickness or in health, a necessity?

As mothers and wives who entrust to your healing care not only our own health and lives, but the health and lives of those whose well-being is of inestimable value to us, we appeal to you to use your utmost influence to protect us and them from the danger which threatens us from the free and sometimes reckless prescription of alcoholic liquors.

We ask of your honorable and learned association such an expression on this subject as shall influence the medical faculty to exercise such care in the use of this terrible agent of evil as may avert such deplorable consequences.

In behalf of the 8,000 members of the Michigan Women's Christian Temperance Union, we most respectfully submit to you this request, earnestly praying you to give it candid consideration.

MRS. B. B. HUDSON,
Prest. W. S. C. T. U.
MRS. J. B. PORTER,
Ch'n Ex. B'd W. S. C. T. U.

Dr. Brodie moved that the communication be received and entered on the minutes.

Dr. Topping moved as a substitute that it be referred to a special committee of three to report upon at the next annual meeting.

Dr. Brodie said he did not object to that.

Dr. Shurley said that considering the importance of the question and the interest it has awakened in the minds of the people and the profession of Michigan, it seemed to him that a larger committee would be desirable, and therefore moved as an amendment to the substitute that the committee should consist of five instead of three.

Dr. Shurley's amendment was accepted by Dr. Topping.

Dr. I. E. Brown, of Monroe, said:—"I don't see any objection to that committee reporting at the present meeting just as well as one year from now. If we were a political body perhaps we might feel delicate about expressing our views upon that subject; but I don't think we consider ourselves as such, and I don't see any objection to the committee's reporting at the present meeting, and I therefore offer as an amendment to that question that they report to-morrow."

The amendment was supported.

After some discussion by Drs. Connor, Brodie, and Brown, Dr. Ward moved that the communication be laid upon the table; which motion was lost.

Dr. Topping's substitute was then duly put and adopted by the Society.

Dr. Shurley, of Detroit, then read a paper on "Inhalation in the Treatment of Diseases of the Respiratory Tract."

On motion of Dr. Whelan the paper was referred to the Publication Committee.

Dr. Brodie then read a paper written by Dr. J. J. Mulheron, of Detroit, entitled "Rheumatism *vs.* Lead-Poisoning," which was, on motion, referred to the usual committee.

Dr. Pratt said that the papers referred to the Committee for Publication with instructions to publish would appear in the Transactions, and moved that the publication of all papers be referred without distinct, definite instructions, should be left to the discretion of the Committee.

Carried.

Dr. Whelan then moved that the Committee be instructed to publish the papers presented by Drs. Shurley and Mulheron.

Carried.

Dr. H. O. Walker, of Detroit, read a paper upon Litholapaxy and Lithotomy, with a report of eight cases of removal

of stone from the bladder, four by each method, with a death in each series. He also exhibited a new urethrotome, which he had devised for the purpose of cutting "large-sized strictures."

Referred to Publication Committee, with instructions to publish.

On motion, the Society adjourned till 2 P. M.

Afternoon Session.

The Society convened pursuant to adjournment, and was called to order by the President, and the roll was called by the Secretary.

On motion, the reading of the minutes was dispensed with.

A large number of proposals for membership was then made and referred to the Committee on Admissions.

President Johnson then called Vice President Thomas to the chair, and, pursuing the regular order of business, proceeded to deliver his annual address, the subject of which was "Heat or Thermic Force."

On motion of Dr. Brodie, a vote of thanks was duly tendered for the same; and on motion of Dr. Pratt, a copy was requested for publication.

The Secretary then read his report as follows:

To the President and Members of the Mich. State Medical Society:

GENTLEMEN:—The Recording Secretary herewith respectfully submits his annual report for 1879-80:

Exclusive of those elected at this meeting, and those whose names have been dropped from the roll of membership on account of arrearages in payment of dues, there are borne upon the roll of membership of this Society 250 names.

There were read at the last annual meeting and published in the Transactions of the Society the following papers, viz.:

"Criminal Abortion," by the President, Edward Cox, M. D., of Battle Creek;

"Shortness of the Umbilical Cord, a Cause of Retarded Labors and of Accidents," by E. P. Christian, M. D., of Wyandotte;

"Some Remarks on Hour-Glass Contraction of the Uterus," by J. S. Caulkins, M. D., of Thornville;

"Fatal Use of the Aspirator—Experiments on the Introduction of Air into the Veins," by Hal. C. Wyman, M. D., of Detroit;

"Two Cases of Lymphadenosis or Hodgkin's Disease, with Observations," by G. K. Johnson, M. D., of Grand Rapids;

"How we Held the Perineum Forty Years ago," by A. F. Kinne, A. M., M. D., of Ypsilanti;

Report of the Committee on Charges Pending in the American Medical Association, by Drs. Wm. Brodie and H. O. Hitchcock, Committee.

"On Moral Insanity," by Simon Herres, M. D., of Westphalia;

"Clinical Notes of Twelve Cases of Ovariotomy," by Donald Maclean, M. D., of Ann Arbor;

"Report on the Work of the State Board of Health," by H. F. Lyster, M. D., of Detroit, Member of the Board;

"Report of the Committee on Necrology," by Wm. F. Breakey, M. D., Chairman of the Committee;

Report of Drs. Wm. Brodie and H. O. Hitchcock, Medical Examiners selected by the Regents of the University to examine medical students of the University for the year 1879.

Other papers were reported to the Society at its last meeting, but were not furnished the Committee for publication.

I made nearly a *verbatim* report of the last meeting, and as Chairman of the Publication Committee prepared the Transactions for the press.

Seven hundred copies of the Transactions for 1879 were published at a cost of $175, of which number five hundred copies have been distributed as in former years, leaving two hundred copies on hand. Two hundred copies of the President's address were published in pamphlet form, as per resolution of the Society, a part of which have been distributed and part remain on hand.

I have collected during the year for initiation fees and dues,	$590 00
Deposited with the Treasurer	555 00
Balance of amount collected	$35 00

I have expended moneys as follows:

For postage on Transactions, notices, letters, etc	$33 00
For stationery	3 00
Total	$36 00

Balance due Recording Secretary, $1.00.

I distributed 600 notices of this meeting, together with railroad certificates, entitling the holders thereof to reduced rates of fare in going to and returning from this meeting. Notice of this meeting was published in the Detroit Free Press, the Detroit Post and Tribune, and the Detroit Evening News, and the insertion of editorial notices in local papers in different parts of the State were procured so far as practicable.

It is gratifying to be able to state, as a symptom of the healthfulness of the Society, that there was a larger attendance at its last annual meeting in Detroit than at any other similar organization in the United States in the year 1879, and nearly as many were in attendance at the annual meeting in Lansing in 1878.

I have been in correspondence with some of the railroad companies in reference to reduced rates of fare for our delegates to the American Medical Association, which convenes in New York City the first proximo, and their decision is pending a meeting of the ticket agents of the different lines, which is soon to be held.

GEO. E. RANNEY,
Recording Secretary.

On motion, the report was accepted, and so much as related to finance referred to the Finance Committee.

The Treasurer then read his report as follows:

REPORT OF TREASURER.

To the President and Members of the Mich. State Medical Society:

I have the honor to submit the following financial report for your consideration, which will show, we think, a satisfactory condition of the finances of the Society:

G. W. Topping, Treas., in acc't with Mich. State Medical Society.

1879.		DR.
June 1.	To balance on hand	$181 12
June 19.	To amount received of Sec'y, Dr. Geo. E. Ranney	555 00
1880.		
May 1.	To interest at 5 % on balances, as per bank book	19 62
	Total receipts for the year	$755 74

1879.		CR.	
June 19.	By payment to Secretary of amount found due him by Finance Committee	$10 50	
June 19.	By payment to Secretary of honorarium voted him by Society at last meeting	100 00	
June 30.	By payment to Free Press Co., advertisi'g 14th meeting	7 00	
June 30.	By payment to Post and Tribune Co., advertising 14th meeting	4 50	
June 30.	By exchange and postage	26	
Aug. 26.	By draft to E. B. Smith & Co., for 1,000 envelopes for Secretary	9 88	
Oct. 23.	By payment to W. S. George & Co., for printing Transactions, etc.	219 25	
Dec. 18.	By payment for printing our President's address	5 00	
1880.	Total disbursements for the year	$356 39	
May 1.	By cash in Central Michigan Savings Bank, as certified by its officers	399 35	
	Total disbursements and on hand		$755 74

In addition to the above amount on hand, I have a due-bill for thirty-six dollars and twenty-five cents ($36.25), to be paid this Society in printing by W. S. George & Co., of Lansing, Mich., which was procured by our Secretary, Dr. Ranney, as a rebate on printing Transactions of this Society for the Year 1879, which will be good to the Society for its face in future printing, and which, if added to the cash in bank, will make the available funds on hand amount to four hundred and thirty-five dollars and 60 cents ($435.60).

G. W. TOPPING,
Treas. Mich. State Medical Society.

DEWITT, MICH., June 1st, 1880.

Accepted and referred to the Finance Committee.

Dr. Eugene Smith, of Detroit, then read a paper on "Ophthalmia Neonatorum."

Dr. J. V. Jones of Chicago, Dr. Foster Pratt of Kalamazoo, Dr. Fuller of Grand Rapids, Dr. Wm. Brodie of Detroit, Dr. Bennett of Coldwater, and Dr. Hitchcock of Kalamazoo, discussed the subject at some length.

On motion of Dr. Connor, the paper was referred to the usual committee, with instructions to publish.

The President announced the names of Drs. Bingham, Brady, and Tupper, to fill vacancies on Finance Committee caused by the absence of Drs. Chittock, Backus, and Kaiser.

Dr. Kinnie, of Ypsilanti, then read a paper on "Eclampsia from Uræmic Toxæmia, Promptly Relieved by the Emetic Operation of Veratrum Viride," which on motion of Dr. Whelan was referred to the Committee on Publication with instructions to publish.

Dr. C. J. Lundy, of Detroit, then read a paper on "Duboisia Myoporoides," a "New Therapeutic Agent in Diseases of the Eye."

On motion of Dr. Connor, the paper was referred to the usual committee, with instructions to publish.

Dr. DeCamp, of Grand Rapids, then read a paper on the "Use of the Actual Cautery." He exhibited the cauterizing instrument, giving some illustrations of its actual workings on pieces of beef-steak. Dr. Donald Maclean, of Ann Arbor, endorsed the instrument exhibited by Dr. DeCamp, gave his own experience with it, and described an attachment he had devised to make it more useful. Dr. Fuller was not inclined to agree with them as to the unvarying good qualities of the instrument, and had obtained better results from the use of other cauteries.

On motion of Dr. McLean, the paper was referred to Publication Committee, with instructions to publish.

Dr. Stoddard, of Muskegon, moved that the reading of the Report on Surgery, of which Dr. McGraw, of Detroit, was chairman, be made the special order immediately following roll call next morning.

Carried.

The Secretary stated that a report from the State Board of Health, prepared by Dr. Hitckcock, had been handed him to read.

The following was then offered by Dr. Whelan:

Whereas, Dr. J. S. Hamilton, of Tecumseh, an active resident member of this Society, through long professional service and advanced age is now prevented from attendance upon this meeting;
***Therefore Resolved,* That his name be placed upon the roll of honorary membership from this date.**

The Secretary seconded the resolution, and stated that he had recently received a letter from Dr. Hamilton in which he remitted his dues to date, and in which he expressed a warm interest in behalf of the Society, and stated that he had partly completed a paper which he had hoped to read at this meeting, but which owing to his own illness he had been unable to finish, and that the same reason precluded the possibility of his availing himself of the pleasure of meeting with the Society at this time, and he feared for all time to come.

Motion carried.

On motion of Dr. Jerome, Dr. D. S. Hall, on account of his long services in the medical ranks as an honorable, loyal member of the profession, was elected an honorary member of the Society.

Dr. Brigham moved, for a similar reason, that the name of Dr. Elezar Hall, of Saline, be placed on the list of honorary members.

Carried.

A number of gentlemen having been elected members of the Society at this meeting, among whom was Dr. O. J. Bissell, it was moved by Dr. Jerome that the committee reconsider the vote making Dr. Bissell a member, and that his name be referred back to the committee on admissions, for reasons that were manifest to the committee, and which could be made manifest to the council if desired.

Carried.

Dr. Shepard moved that the report from the State Board of Health be made the special order to follow the reading of the report on Surgery by Dr. McGraw.

Carried.

On motion of Dr. Brodie, the meeting adjourned till 10 o'clock next day.

Second Day—Morning Session.

The Society convened in pursuance to adjournment, and was called to order by the President, and roll was called by the Secretary.

On motion of Dr. Brodie, the reading of the minutes was dispensed with.

The President designated Dr. Kinne, of Ypsilanti, to fill a vacancy on the Committee on Admissions.

The Chairman of the Committee on Admissions requested that if objections were known to the admission of any one who had or should apply to become members, that the objections should be made known to the Committee and not to the Society.

The Secretary read the names of a number of applicants for membership, which applications were referred to the usual committee.

The Secretary then read the following dispatch:

CHICAGO, ILL., *May 12, 1880.*

Dr. George Ranney, Sec'y Mich. State Medical Society (care of Dr. G. K. Johnson):

Expected to be present at the meeting, but am unavoidably detained. Believe me to be with you in spirit if not in the flesh. Although no longer a resident of Michigan, I am interested in its State Medical Society, and wish for it and its members the fullest measure of success and prosperity.

E. W. JENKS.

On motion, the dispatch was ordered to be spread upon the minutes.

The Finance Committee then made the following report:

To the Michigan State Medical Society:

Your standing Committee on Finance have examined the accounts of the Secretary and Treasurer and their vouchers, and beg leave to report, that as shown by the report of the Secretary, the resources of the Society during the past year have been as follews:

From fees and dues		$590 00
Of this amount he has paid:—		
To the Treasurer	$555 00	
For postage	33 00	
For stationery	3 00	
	$591 00	
Leaving due the Secretary	1 00	
The report of the Treasurer acknowledges the receipt from the Secretary		$555 00
Balance on hand June 1st, 1879		181 12
Interest on deposits		19 62
Total		$755 74
His disbursements, as shown by his report, verified by vouchers, have been		356 39
Leaving balance in his hands belonging to the Society,		$399 35

He also holds the due-bill of W. S. George & Co. for $36.25, payable in printing as rebate from bill for publishing Transactions of 1879.

Respectfully submitted.

EDWARD COX,
H. TUPPER,
IRA P. BINGHAM,
JOHN BRADY,
A. P. DRAKE,
Committee.

On motion of Dr. Brodie, the report was accepted and adopted.

Dr. Foster Pratt, Chairman of the committee appointed at the last annual meeting to report upon ex-President Cox's Address, then read his report, which, on motion, was referred to the Publication Committee with instructions to publish.

Dr. McGraw, Chairman of the Committee on Surgery, then read his report, which, on motion of Dr. Maclean, of Ann Arbor, was similarly disposed of.

Dr. Hitchcock's report for the State Board of Health being next in order, the Secretary proceeded to read the paper, which embodied the following resolution, which elicited considerable debate:

Resolved, That in the opinion of the members of this Society the laws of the State requiring physicians to report to the local board of health, or to the health officer of their locality, all cases of sickness and death, of diseases contagious or dangerous to the public health, are wise and proper, and ought to be complied with.

The resolution was strongly opposed by Dr. Brodie, of Detroit, and several others. They asserted that the State had no right to compel the services of physicians in such duties without remuneration therefor. Dr. Jerome, of East Saginaw, Dr. Hitchcock and others approved the resolution, and urged that the physicians should render such services for the benefit of the public.

On motion of Dr. Pratt, the report, including the resolutions, were adopted by a standing vote.

Dr. Chase, of Otsego, offered the following, which was referred, as he requested, to the Judicial Council:

Resolved, That the Committee on Judiciary try to frame, for the consideration of this Society, some rule of procedure or by-law that will guard this Society against the admission to our membership of men who have never graduated at a medical school, or attended a medical school, until they shall have undergone an examination as to professional acquirements by the Board of Censors of this Society, and received a favorable recommendation by the Board that they may be admitted to membership.

The following preamble and resolution, offered by Dr. Christian, was adopted:

WHEREAS, The State Medical Society of Michigan views with gratification the evidences that its labors for a more elevated standard of medical education have not been without reward, in the fact that all the medical schools of this State have made a preliminary examination and a three-term graded course a requisite for graduation; therefore,

Resolved, That we, the members of the State Medical Society, pledge ourselves, individually and collectively, to support only such schools as require for admission a thorough preliminary examination, and for graduation at least a three-term graded course of lectures in three years of study; and that we will use our influence to prevent students from attending any college with an inferior standard of preparation and graduation.

Dr. Pratt moved that the President be requested to appoint a committee, consisting of five members, to nominate officers for the ensuing year except that of President, also delegates to the American Medical Association for 1880.

Carried.

The President appointed as such committee Dr. Brodie of Detroit, Dr. Drake of Hastings, Dr. McGraw of Detroit, Dr. Topping of DeWitt, and Dr. Maclean of Ann Arbor.

The session then adjourned until 2 o'clock P. M.

Second Day—Afternoon Session.

The meeting was called to order by the President, Dr. Johnson, and the roll was called by the Secretary.

On motion, the reading of the minutes was dispensed with.

Dr. Fuller, of Grand Rapids, presented a paper describing two severe cases of crushing of the feet and their treatment.

On motion of Dr. Jerome the paper was referred to the Committee on Publications with instructions to publish it.

Dr. Brodie said that he had a paper prepared by Dr. C. C. Yeamans, of Detroit, who had been detained at home on account of sickness, and he moved that the paper be received and referred to the Committee on Publications, leaving it discretionary with the Committee whether to publish it or not.

Carried.

Dr. Brodie, one of the Examiners appointed to examine

candidates for graduation in the Medical Department of the University of Michigan, read his report, which, on motion of Dr. Jerome, was referred to the Publication Committee with instructions to publish.

On Dr. Stoddard's motion the recommendation in the report was adopted as the sense of the Society.

The Secretary announced that he had received from Dr. Bissell a memorial addressed to the Society, and as his application for membership had been reconsidered and referred to the Judicial Council, it was a paper which under the rules was not for the Society to discuss, and moved that it be referred to the Judicial Council.

After some debate the motion was carried.

The Committee on Nomination of Officers presented their report, recommending:

For First Vice President—Dr. E. P. Christian of Wyandotte.
For Second Vice President—Dr. J. W. Hagadorn of Lansing.
For Third Vice President—Dr. C. J. Lundy of Detroit.
For Fourth Vice President—Dr. J. H. Bennett of Coldwater.
For Recording Secretary—Dr. Geo. E. Ranney of Lansing.
For Treasurer—Dr. G. W. Topping of DeWitt.
For Delegates to the American Medical Association—Drs. Wm. Brodie of Detroit, J. H. Jerome of Saginaw, Foster Pratt of Kalamazoo, J. A. Brown of Detroit, H. O. Hitchcock of Kalamazoo, G. K. Johnson of Grand Rapids, E. S. Dunster of Ann Arbor, E. L. Shirley of Detroit, J. Miller of Mount Pleasant, H. B. Barns of Ionia, L. W. Bliss of Saginaw City, W. L. Dickinson of East Saginaw, A. F. Kinne of Ypsilanti, J. B. Book of Detroit, S. G. Banks of Detroit, E. Smith of Detroit, F. J. Langlois of Wyandotte, T. A. McGraw of Detroit, Donald Maclean of Ann Arbor, W. J. McHench of Brighton, A. W. Riker of Fenton, J. W. Robertson of Detroit, J. R. Thomas of Bay City, William Brownell of Utica, L. W. Fasquelle of St. Johns, Edward Snow of Dearborn, D. W. C. Wade of Holly.

The report of the Committee was accepted, and being adopted, the various candidates were declared duly elected.

The next business being the election of President, Dr. Ward nominated Dr. J. R. Thomas of Bay City; Dr. Maclean nominated Dr. Whelan of Hillsdale.

On motion, the Chair appointed two tellers, viz.: Drs. H. B. Shank and L. W. Bliss.

On motion of Dr. Brodie, the Society proceeded to take an informal ballot, which resulted as follows:

Dr. J. R. Thomas received	45 votes
Dr. A. F. Whelan	28 "
Scattering	3 "

Dr. Brodie said that while Dr. Whelan's name was presented through kindness by his friends, he was not personal

a candidate, and that he was in favor of making the nomination of Dr. Thomas unanimous, and hoped the vote would be made so.

On motion, a formal ballot was ordered, and on motion of Dr. Shank, the Secretary was instructed to cast the ballot for the Society, which ballot being for Dr. J. R. Thomas, that gentleman was declared unanimously elected.

During the balloting the Judicial Council rendered the following report:

GRAND RAPIDS, MICH., *May 12, 1880.*

Judicial Council met at 2 P. M. Present—Drs. Wm. Brodie, Foster Pratt, A. F. Whelan, H. B. Shank, J. A. Brown, J. H. Bennett, and Wm. Parmenter.

The Council report:

In the matter of the complaint made by Dr. Eugene Smith, of Detroit against a member of this Association for violation of the code of ethics, that the complaint was withdrawn by him for the reason that the violation complained of has ceased.

In the matter of the charges preferred by Dr. E. Twiss, first entered in 1878 against Drs. A. B. Palmer, Donald Maclean, Edward Dunster, and W. J. Herdman, of the Medical Department of the University of Michigan, members of this Society:—That the charges are withdrawn by Dr. E. Twiss, because the *resolution* of the American Medical Association, adopted by it in 1876, under which the charges were made, was decided in 1878 by the Judicial Council of that Association not to be part of the ethical code.

In the matter of the charges for unprofessional conduct preferred by Dr. C. V. Beebe, of Howell, against Dr. W. L. Wells of the same place, and applicant for membership in 1879 and recommended by the Committee on Admissions, afterward in the same year referred to the Judicial Council:—That the charges are sustained, and that the recommendation of the Committee on Admissions is not concurred in.

In the matter of the case of Dr. O. J. Bissell, referred by the Association to the Council pending his application for membership:—That the Council do not concur in the recommendation of the Committee on Admissions.

WM. BRODIE, *Chairman.*
WM. PARMENTER, *Scribe.*

Report accepted and adopted.

Dr. Ward then moved that the President appoint a committee of three to wait on Dr. Thomas and inform him of his election and conduct him to the chair.

Carried.

The President appointed as such committee Drs. Ward, Jerome, and Donald Maclean.

Dr. Tupper said that in behalf of the physicians and citizens of Bay City he extended an invitation to the Society to hold its next annual meeting in that city, and hoped that every doctor would come and bring his wife and family to share their hospitality.

Dr. Thomas, the newly-elected President, was then conducted to the platform by the committee appointed for that purpose, when the out-going President, Dr. Johnson, welcomed him to the chair and said:

"Gentlemen of the Michigan State Medical Society: I have the honor of introducing to you our President for the ensuing year."—[Applause.]

Dr. Thomas said:

"Gentlemen of the Michigan State Medical Society: I am surprised to find myself in this position, and I am here without words to adequately express to you the thanks I feel for the honor you have conferred upon me, for there are times when the tongue fails to express the sentiment which the heart would prompt. But our time is limited, and I will not trespass upon it. Thanking you again, and relying upon the forbearance, aid, and support in the future, which your partiality in the past leads me to hope for, I bespeak for the Society a prosperous year, and promise to use my best efforts to promote its interests."

On motion of Dr. Brodie, the Society proceeded to elect three members to the Judicial Council to fill vacancies caused by the expiration of the term of office of Drs. Foster Pratt, H. B. Shank, and Edward Snow.

Dr. Brodie moved that these gentlemen be their own successors.

Dr. Cox moved as a substitute that the Secretary be authorized to cast the ballot for these gentlemen.

Carried.

The Secretary cast his vote in accordance with the resolution, when Drs. Pratt, Shank, and Snow were declared unanimously elected as members of the Judicial Council for the term of three years.

On motion of Dr. Jerome, the Secretary was allowed $100 for his services during the past year.

The Committee on Admissions here completed their report, showing that during the session they had recommended for membership the following named gentlemen, who, on vote of the Society, were declared elected:

W. B. Anderson, Bloomingdale.	Milan Chase, Otsego.
Joseph Albright, Grand Rapids.	S. H. Clizbee, Coldwater.
*O. J. Bissell, Grand Rapids.	J. Campbell, Byron Centre.
Eugene Boise, Grand Rapids.	Chas. P. Donelson, Muskegon.
Thos. D. Bradford, Gr'd Rapids.	Wm. L. Dickinson, E. Saginaw.
Jas. M. Cook, Muskegon.	J. F. Farling, Gobleville.

*Membership not completed.

Wm. Fuller, Grand Rapids.
*Pierce J. Fullerton, Middleville.
John F. Ferguson, Middleville.
Henry Hull, Ravenna.
Marion Holland, Lamont.
Jas. H. Johnson, Whitehall.
Chauncey E. Koon, Casnovia.
J. A. Mabbs, Fillmore Centre.
Chas. H. Maxim, Grand Rapids.
Jas. A. McPherson, Gr'd Rapids.
H. H. Power, Ionia.
S. V. Romig, Ionia.
H. W. Strong, Byron.
Herman H. Schoberg, Kalmazoo.
Erastus Spaulding, Gr'd Rapids.
W. N. Smart, Grand Haven.
Jas. M. Sligh, Grand Rapids.
Perry Schultz, Gr'd Rapids.
*J. M. Sutherland, Caledonia.
A. L. Van Horn, Dowling.
Dan'l J. Wallace, Sparta Centre.
Ezra Walling, Berlin.
Wyllys S. Walker, Spring Lake.
Albert W. Weston, Grandville.

There were other members in attendance, as follows:

Thos. Addison, Rockford.
R. Alton, Portland.
C. W. Backus, Three Rivers.
S. G. Banks, Detroit.
H. B. Barnes, Ionia.
J. H. Bennett, Coldwater.
Ira P. Bingham, Brighton.
L. W. Bliss, Saginaw City.
J. B. Book, Detroit.
Judson Bradley, Detroit.
John Brady, Grand Rapids.
Wm. Brodie, Detroit.
J. E. Brown, Monroe.
J. A. Brown, Detroit.
N. F. Brown, Detroit.
C. B. Burr, Pontiac.
E. P. Christian, Wyandotte.
H. A. Cleland, Detroit.
E. H. Coller, Athens.
L. Connor, Detroit.
Edward Cox, Battle Creek.
W. Decker, Mt. Clemens.
Wm. H. DeCamp, Grand Rapids.
A. P. Drake, Hastings.
J. O. Eddie, Grand Rapids.
J. M. Elliott, Hickory.
W. J. Fairfield, Battle Creek.
L. A. Foote, Battle Creek.
F. B. Galbræth, Pontiac.
Mary E. Green, Charlotte.
J. B. Griswold, Grand Rapids.
A. D. Hagadorn, Milford.
J. W. Hagadorn, Lansing.
D. C. Hauxhurst, Battle Creek.
S. Herres, Westphalia.
H. O. Hitchcock, Kalamazoo.
Geo. Howell, Macon.
J. H. Jerome, Saginaw City.
G. K. Johnson, Grand Rapids.
J. Kapp, Ann Arbor.
F. P. Kenyon, Montague.
D. B. Kilpatrick, Woodland.
A. G. Kimball, Jackson.
Amos F. Kinne, Ypsilanti.
S. J. Koon, Lisbon.
T. J. Langlois, Wyandotte.
C. J. Lundy, Detroit.
O. C. Lyon, Detroit.
Hugh McCall, Lapeer.
Thos. A. McGraw, Detroit.
Donald Maclean, Ann Arbor.
A. C. Maclean, Ann Arbor.
D. McLeay, Prairieville.
J. Miller, Mt. Pleasant.
Frank K. Owen, Ypsilanti.
Wm. Parmenter, Vermontville.
P. D. Patterson, Charlotte.
Jabez Perkins, Owosso.
Foster Pratt, Kalamazoo.
Geo. E. Ranney, Lansing.
A. H. Reed, Napoleon.
A. W. Riker, Fenton.
H. B. Shank, Lansing.
Chas. Shepard, Grand Rapids.
C. S. Sheldon, Greenville.
E. L. Shurley, Detroit.
Eugene Smith, Detroit.
D. E. Spaulding, Lyons.
J. P. Stoddard, Muskegon.
J. R. Thomas, Bay City.
M. W. Tomlinson, Battle Creek.
G. W. Topping, DeWitt.
H. Tupper, Bay City.
H. J. Turner, Wayland.
E. Twiss, Athens.
D. W. C. Wade, Howell.
H. O. Walker, Detroit.
E. B. Ward, Laingsburgh.
A. F. Whelan, Hillsdale.
Eli Woodman, Farmington.
S. R. Wooster, Grand Rapids.
W. H. Young, Nashville.

*Membership not completed.

The following preamble and resolutions were offered by Dr. J. H. Bennett of Coldwater:

WHEREAS, The State Public School at Coldwater is the only great institution in the West favorable for studying the diseases of childhood, and should be the proper location for the collection of statistics in the diseases of childhood;

AND WHEREAS, Several epidemic diseases, and also several zymotic diseases have prevailed among the inmates of that institution; therefore

Resolved, That it is the judgment of this Association, that the medical and surgical management of said school should be placed in the care of competent and careful medical men, and that careful and proper clinical records should be preserved, which would furnish statistics and data for the investigation and study of the diseases of infancy and childhood; and be it further

Resolved, That the Chair appoint a committee of three to lay a copy of these resolutions before the Board of Control of said School, and urge the adoption of the measures set forth in these resolutions.

Adopted.

Dr. Maclean, of Ann Arbor, read a paper on "Clinical Observations and Practical Deductions," and illustrated it with several specimens and instruments used in his practice in the Clinic of the Medical School of the State University. It was, on motion, referred to the Committee on Publication and ordered published.

All other papers reported to the Society at this meeting but not read, were, on motion of Dr. Pratt, referred to the Committee on Publication, with discretion to publish them or not, in the proceedings of the Society, as may be deemed wise.

Dr. Cox, of Battle Creek, offered a resolution expressing the thanks of the Society to Dr. and Mrs. Johnson, and to Mr. and Mrs. F. B. Gilbert for the splendid entertainment given to the Association on the previous evening.

The motion was adopted by a rising vote and many demonstrations of hearty endorsement of all the resolution implied.

Dr. Brodie presented a resolution, which was adopted, thanking Judge Holmes for the use of the court-room; also thanking such railroads as had made reductions to members attending the meeting; to the press of the city for the interest it showed in the meeting and the full reports given of the session; and to the presiding officer and other officers of the Society for the faithful manner in which they had performed their duties.

Dr. Parmenter moved that when the Society adjourns, that it does so to meet on the second Wednesday of June, 1881, and that the President be authorized to appoint delegates to the American Medical Association for 1881, as that body would probably meet in the South during the May preceding the next annual meeting of this Society.

Carried.

A motion was then made to adjourn.

President G. K. Johnson said, that before putting that motion, he wished to thank the members of the Society for the kind and civil manner with which they had treated him during his term of office, and said he believed the meeting had been a general success, and that much good would accrue to all concerned.

The motion to adjourn was then put and carried.

GEO. E. RANNEY, M D.,
Recording Secretary.

INHALATION IN THE TREATMENT OF DISEASES OF THE RESPIRATORY TRACT.

BY E. L. SHURLY, M. D., DETROIT.

Having had considerable opportunity during the past few years of testing this method in the treatment of the various acute and chronic diseases of the respiratory tract, I beg leave to present, as briefly as possible, some of the results of my experience,—more with the desire of exciting discussion than seeking acquiescence in the views expressed. I cannot accord with the many glowing accounts in print now-a-days of the very general triumph achieved by this method; but believe, that like every other therapeutic measure, its success depends upon very careful discrimination, both as regards the patient selected and the particular form and agent used for inhalation.

There are certain classes of cases, undoubtedly, greatly benefited by inhalations, and there are others more or less injured thereby, and just what rules to lay down for a wise discrimination I do not know; suffice it to say, that I believe careful experiment and close observation are our only guides.

It is often forgotten that the effect of a given inhalation depends upon the temperature, moisture, and amount of exercise required, as much as upon the drug or gas used to medicate the inspired air. When we remember that the respiratory tract is intended to receive only ordinary air, we cannot be astonished at the ill-effects which often follow our best directed efforts to medicate in this way.

In many acute affections of the bronchial tubes and lungs the heat and moisture with which the inspired air is loaded—from an ordinary so-called "vapor inhalation"—will cause such a degree of swelling and irritation of the mucous membrane, on account of the absorption of the moisture by the

ciliæ of the mucous membrane, as to greatly aggravate the diseased condition, notwithstanding that the drugs employed are of the mildest character; while in other cases the muscular effort required to perform the act is productive of mischievous exhaustion or "febrile action."

There are four different methods of inhalation at present in use, viz.: Atomization; medicated vapor; dry medicated air, including fumes, compressed air, and gases; and insufflation of powders.

The atomization of the medicated fluid is accomplished either by steam or compressed air. By this means any substance which is soluble may be projected into the throat or nose in a nebula or cloud. On account of admixture with steam it is obvious that a nebula from a steam apparatus is much more dilute than from a compressed air apparatus,—the difference being at least one-third. But, on the other hand, it is thought that the penetration of the former—steam—is very much greater owing to the temperature. That this is, undoubtedly, true, may be proved by the greater facility with which the systemic effect of a drug can be obtained by the former, when the inhalation is properly conducted.

The mooted question, of the penetration of atomized liquids into the smaller bronchi and pulmonary cells, may be looked upon as definitely settled if we will allow for differences of anatomical conformation and skill in the art of inhaling, upon which all the bitter controversy heretofore existing may be justly considered to have depended. This sort of medication, however, is most useful in the affections of the pharynx, larynx, trachea, and nasal passages,—the steam being preferable for affections of the larynx, trachea, and nose,—except in office practice, when the compressed air is not so objectionable because under our immediate direction. In acute and subacute pharyngitis, nothing is more grateful than the projection of an atomized solution of ac. carb., or ac. carb. et alum., every two or three hours; also in the earlier stages of tonsillitis. In cases, however, where the mucous membrane is greatly relaxed and sodden this plan is not so well borne. In some cases of acute as well as chronic laryngitis, the atomization of a solution of either ammon. mur., ac. carb., tr. opii, f. ext. conium, or hammamelis, are productive of great relief; while in others, characterized by excessive swelling, this procedure causes increased distress; and we are obliged to resort to the direct projection upon the parts of plain or carbolized vaseline, or petrolina,—carbolic acid being, according to the experiments of Dr. Glasgow and others, one of the best anal-

gæsics for the larynx. In cases of ulcerative laryngitis, either due to syphilis or phthisis, applications direct with the brush must be added to our other local treatment. In the various acute and chronic diseases of the nose, one of the most efficient modes of local treatment consists of the projection into the nares of a spray of plain or medicated vaseline—as first suggested by Dr. Rumbold—or petrolina. (Petrolina oil is a new liquid preparation from petroleum, which I have lately used as a substitute for vaseline.)

Regarding the use of atomization in the several forms of phthisis, I have seen very little benefit. I have tried in several instances, both in hospital and private practice, the atomization of two per cent and stronger solutions of benzoate of soda, as recommended by Rokitanski, but with negative results. Dr. Zimdars, of Colorado, however, writes me that he has met with good success in its use, in experiments upon himself and some of his patients. In some cases of ulceration of the pharynx,—specific, phthisical, and scrofulous,—atomization has proved more beneficial than other kinds of local treatment; while in ordinary croupous and diptheritic laryngitis it is a necessary element of any plan of treatment.

The so-called vapor inhalations consist of the inspiration of air which has previously passed through hot water, containing some balsamic or other medicament. There are many inhalers in the market for the accomplishment of this object,—all constructed, however, upon the same principle, viz.: causing the air to pass through the liquid before entering the mouth. On account of the fluid medium used—hot water—it is obvious that the air is more or less loaded with moisture and also raised in temperature,—a fact which, for reasons already given, render this mode inapplicable to certain cases whatever medicine may be employed. In those varieties of nasal, pharyngeal, and bronchial catarrh, characterized by dryness of the mucous membrane, the employment of some stimulating balsam or oil by this means is productive of the greatest benefit. When there is great irritability, chloroform, conium, opium, yerba santa, droseria rotundifolium, carbolic acid, benzoin, etc., are useful. When the sensibility of the membrane is obtunded, or the glands more or less atrophied, more stimulating agents,—such as oil of Scotch pine, turpentine, Canada balsam, liquid pitch, oil of cubebs, and iodine, etc.,—may be employed. In cases of remaining thickening of the vocal cords and laryngeal mucous membrane, after acute laryngitis or bronchitis, these inhalations are excellent, especially a combination of carbolic acid and tincture of iodine. There are

certain cases of chronic bronchitis and fibroid phthisis, pathologically characterized by extensive structural change in the adenoid tissue, with more or less emphysema or lobular collapse, which are greatly benefited by judicious inhalations of the iodine, iodoform, or balsam vapors; and lastly, in those cases of chronic catarrhal pneumonia and bronchitis, attended by incessant cough, which at times defies the ingenuity of man to mitigate, one or the other of these vapor inhalations may prove the only thing which will afford relief.

In acute tuberculosis (or, I ought to say, phthisis), especially with a tendency to hemoptysis, I have found, with few exceptions, that these inhalations did more harm than good, unless late in the course of the disease, when they would sometimes mitigate cough or promote easier expectoration.

Under the head of inhalation of gases, we shall include respiratory exercise or gymnastics, compressed and rarefied air, fumes, etc. With compressed and rarefied air I have had but little experience, relying always upon the ordinary air to accomplish the purpose for which these are generally used; viz.: dilatation of collapsed lobules. For this condition I usually direct the patient to sit at stated intervals, loosely dressed, and slowly perform forced inspiratory and expiratory motions, never going beyond the point of fatigue. Common sense will dictate that this exercise is not to be enjoined upon patients who are prone to hemoptysis, or to those suffering from acute affections or febrile movement, but upon those who are tolerably strong, tranquil, and possessed of emphysematous, collapsed, or contracted lobules, and should at once be stopped upon the supervention of pain, great fatigue, or other untoward symptoms.

Of the natural gases of the atmosphere, I shall mention only oxygen and nitrogen. The former, however, may be dismissed with a word, inasmuch as it is for the most part only applicable to cases of asphyxia.

The inhalation of nitrogen, diluted with atmospheric air, was first used in the treatment of pulmonary phthisis, in Germany about two or three years ago. Dr. Stœrk,—who, I think, first laid this treatment before the profession,—generated the gas in an elaborate apparatus, composed of a series of cylinders, conducted to and opening into an inhaling tube provided with a valve; in these the gas is generated by the action of a solution of sulphurate of iron on iron filings, and the necessary air admitted during the process of inhalation. Not being able to procure his apparatus, I have had one constructed of tin, similar to a large culinary steamer: it is about 24 inches high and about 14 inches in diameter; it is provided with a

two-inch opening at the top, which is supplied with an easy working valve moving inward; at the middle there is transversely located a perforated diaphragm for the reception of the iron filings and solution of iron, and near the bottom and at the side there is a projecting tube with stop cock, to which is attached the rubber hose and mouth-piece for inhaling purposes; beneath the diaphragm, and running obliquely downward, is a plate of tin for dispersing the air. This apparatus, although rather clumsy, answers the purpose very well, by a little additional care. I have used this inhalation in a number of cases, and although I am unable to endorse the highly flattering accounts of its success given by Dr. Stœrk, I have found it quite beneficial in a few cases. Its action is sedative, as might be expected from the feeble chemical activity of pure nitrogen, and it is therefore most useful in acute and chronic inflammatory conditions, with irritability of the terminal nerve filaments, when the necessary effort of inhalation does not contra-indicate. I have tried it in some of those cases of fibroid phthisis attended by terrible cough, but have been generally disappointed in the results. In two cases, with circumscribed softening, it proved very beneficial.

The inhalation of the fumes of burning drugs, and slowly evaporating tinctures, balsams, etc., I believe is destined to come into more general use in the treatment of pulmonary affections than heretofore. By this means the air to be inspired can be quite effectually medicated without materially changing its hygrometric or caloric properties, and without the fatigue of inhaling. The good effects of this method in treating spasmodic asthma, etc., has long been recognized; and lately I am glad to see that it is being adopted in other pulmonary troubles. It is very easy of application, by keeping up more or less constantly, in the apartment where the patient sits or sleeps, the burning of a balsamic or anodyne pastile, or the evaporation of a tincture of some balsamic substance, quantities of the tincture being dropped from time to time upon a sponge which is kept in some suitable vessel on the stove or over an alcohol lamp.

I have at present under observation two patients, phthisisical, who cannot sleep more than two or three hours at night without the air of the apartment is thus medicated; and in several cases of influenza I have found the greatest relief afforded the patients by burning every now and then a little liquid pitch or benzoin in the room.

These dry inhalations are generally best borne in those chronic affections attended by excessive expectoration.

It is scarcely necessary to call attention to the point that very often the success of many of these inhalations will depend upon the direct supervision of the physician; for we all know that an untutored patient will, as a rule, inhale in such a manner as to medicate only the mouth or anterior part of the nasal passages, and especially is this true of atomization.

It is not the purpose of this paper to enter into the details of the proper manner of conducting inhalations, inasmuch as there are several good text-books in print giving full directions.

Now, a word upon the *philosophy* of this method of local treatment. It is a well known fact that certain drugs have a selective action upon the mucous membranes, especially the pulmonary and urinary tracts, which is supposed by some to depend upon their elimination from the system through these structures; therefore, unless some important modification of the drug takes place during its sojourn in the blood, we ought to get as good an effect pending its ingress as its egress from the body through the pulmonary mucous membrane, and this seems to be the case in at least a minority of cases. But do we get the systemic effect of a drug introduced by inhalation through the medium of the blood? or by its local effect upon the terminal nervous filaments of the mucous membrane? Although there is little doubt that gases and volatile medicaments are absorbed by the pulmonary mucous membrane, I believe it is only in very small quantity and much slower than generally acknowledged, because in the physiological state the membrane is not fitted for the absorption of promiscuous substances; and in the *pathological*, its powers are still more limited. I believe that the anæsthetic effect of chloroform, ether, ammonia, and nitrite of amyl, are principally due to their direct effect, first upon the end filaments of the pulmonary nervous expansions, and thence conveyed to the centers,—for the amount of these agents which actually enters the lungs in the time taken for ordinary anæsthesia, if diffused through the blood, and thus diluted, would probably fail to produce such marked anæsthesia; hence, it seems to me, that the *real therapeutic value* of this mode of local medication rests more upon the *local* than the general effect produced, and that in but very few, if any cases, can it be relied upon for curative results without the contemporaneous adoption of dietetic and hygienic plans of treatment.

I have purposely omitted drawing attention to "insufflation of powders," because they are only used now-a-days in special affections of the pharynx, larynx, and nose.

A NEW THERAPEUTIC AGENT IN DISEASES OF THE EYE.

BY C. J. LUNDY, M. D., PROFESSOR OF DISEASES OF THE EYE, EAR, AND THROAT, IN THE MICHIGAN COLLEGE OF MEDICINE, AND OPHTHALMIC AND AURAL SURGEON IN CHARGE OF THE MICHIGAN FREE EYE AND EAR INFIRMARY, DETROIT, ETC.

MR. PRESIDENT AND GENTLEMEN OF THE SOCIETY:—I propose to occupy your time for a few moments with some remarks on a new agent in ophthalmic therapeutics. I say in ophthalmic therapeutics, for it is only in diseases of the eye that the remedy has been used to any extent; but I am inclined to believe that it will be found useful in a much wider field. This therapeutic agent is Duboisia myoporoïdes, obtained from an Australian shrub, of the natural order solanacea. There are several members of this family, one of which is the Duboisia hopwoodii, whose leaves are chewed by the natives of Australia for their stimulating and intoxicating effect, and by whom it is called *pituri*.

The Duboisia myoporoïdes grows to a height of from twelve to twenty feet, and the leaves, which are five inches long and three-eighths to three-fourths of an inch wide, are the parts used in the manufacture of the extract and other preparations. The action of the duboisia as a mydriatic was first brought to the notice of the profession by Dr. Bancroft of Brisbane, Australia. He it was who also pointed out the fact that the duboisia myoporoïdes was more powerful in its action than the other members of this family.

The Duboisia myoporoïdes contains an alkaloid called *duboisin*, which was discovered almost simultaneously by Mr. Gerard of London, who read a paper on it before the Pharmaceutical Society on April 3d, 1878; and by M. Pétit, who read a paper

on the same subject and on the same day before the Paris Acadamie.

Through the kindness of Messrs. Parke, Davis & Co., of Detroit, I am able to exhibit to the Association a sample of the extract of duboisia. Their chemist, Professor Carl Jungk, Ph. D., has kindly prepared for me a few grains of the sulphate of the alkaloid, which I take pleasure in showing you. This extract which has been imported by Messrs P., D. & Co. is of semi-solid consistency, very dark in color with a greenish tinge, of peculiar odor, pungent, almost acrid taste, and is soluble to a certain extent in water, to which it imparts a peculiar muddy color. It is said to contain a trifle more than one grain of the alkaloid to each one hundred grains of the extract, which, from observation of its physiological action on the sphincter of the pupil and on the ciliary muscle, I would consider a tolerably correct estimate.

Accompanying the sulphate of duboisia prepared for me by Professor Jungk, was a communication concerning its chemistry and mode of preparation. From that communication I have made a few quotations as follows: "I found it impossible to obtain it (the sulphate of duboisia) in the crystalline condition; and from accounts of other experimenters it seems the salts are not crystallizable, or crystallizable only with great difficulty. The alkaloid was prepared from the extract of duboisia by precipitation with phosphomolybdate of soda. The salt would not part with any of its color to animal charcoal, and therefore cannot be a colorless substance. By combustion with soda lime, it gives off ammonia, indicating a body containing nitrogen. In concentrated sulphuric acid it dissolves without change of color; on heating it turns brown; additions of nitric acid to this mixture decolorize it; a further addition of a small crystal of potassium bichromate causes a fine green coloration, which gradually assumes a darker hue." The Professor goes on to say that it forms precipitates with several of the re-agents for alkaloids, and that it readily splits up or decomposes. As you perceive, this preparation of the salt is of a brownish color, but other preparations which I have seen are of a yellowish white, and were in irregular amorphous masses. Whether it crystallizes in any particular form I am unable to say.

Owing to the extremely high price of the drug it has been employed in this country only to a limited extent, and its use has been confined almost exclusively to ophthalmic practice.

In many respects its action on the eye, as well as on the system, resembles that of belladonna and hyoscyamus; and

Professor Jungk states that the reactions of duboisia show a great similarity to the reactions of hyoscyamia. However, its action seems more prompt than that of either belladonna or hyoscyamus, while its effects are more transient.

From his experiments with this drug on the lower animals, Dr. Bancroft was led to the conclusion that it produces death by arresting respiration.

Professor Norris of Philadelphia also experimented with this drug on dogs and other animals. The sulphate of duboisia was the form in which it was used, and of this one-twelfth of a grain was injected beneath the skin. He found it to produce intoxication, delirium, dilatation of the pupils, and loss of coördinating power of the limbs, and also a relaxation of the sphincters and twitching of the extremities. The rate of the pulse was greatly increased, while its force was much diminished. Within five or ten minutes the pulse was two hundred to two hundred and forty per minute, and soon became irregular and intermitting. The respirations reached the enormous rate of more than two hundred per minute. The respiratory movement became irregular and jerky, and varied in frequency from one minute to another. The temperature was increased four or five degrees above the normal within the first half hour, but it became normal again within an hour or two.

For a year or more the duboisia has been used to some extent by many of the oculists of this and other countries, and the time is not far distant when it will assume a permanent place in the list of therapeutic agents employed by the ophthalmic surgeon. Whether it shall be entitled to claim a place in the list of remedies employed by the general physician, time will determine. In the mean time, a brief history of some observations made by myself in regard to its action on the eye as well as on the system, the notes of a couple of cases, and a few remarks concerning its application to the cure of eye diseases may not, I trust, prove wholly devoid of interest.

About nine months ago I began the use of duboisia, since which time I have employed it in a large number of cases. I have used it in the healthy eye either for the purpose of enabling me to correct errors of refraction, or with a view of observing its physiological effect on the visual organs; and I have used it in the diseased eye for the purpose of testing its therapeutic value in a certain class of diseases.

In regard to its physiological action, my experiments show that it dilates the pupil very rapidly, and completely and thoroughly paralyzes the muscle of accommodation. Its action is

much more prompt than that of belladonna or of its alkaloid atropia. In certain of the cases where strong solutions were used, the dilatation of the pupil began in four minutes; in others it began in five to eight minutes; while in a few instances nine or ten minutes elapsed before any positive signs of dilation were manifest. As a rule, the stronger the solution employed, the more rapid the dilatation of the pupil, but in no case did I use a solution stronger than two grains of the sulphate of the alkaloid to the ounce of water. When very weak solutions were used, dilation did not begin for fifteen or twenty minutes, or even longer. With the stronger solutions, the pupil dilated to the maximum, except in one or two cases, although even in these slight toxic effects of the drug were manifest. In almost every case a few drops of a solution containing two grains of the sulphate of duboisia to the ounce of water produced complete dilatation of the pupil in fifteen to eighteen minutes. Complete dilatation of the pupil may be produced by a single drop of a solution containing one-thirty-second of a grain of the salt to the ounce of water; while one drop of a solution one-half this strength, or one sixty-fourth of a grain to the ounce, will dilate the healthy pupil very widely. One drop of a solution of the extract, containing one grain to the dram of water, will dilate the pupil *ad maximum;* while solutions one-half or one-fourth this strength will produce very wide dilatation.

The effects of the drug upon the pupil lasted from forty-eight hours to six or seven days, according to the strength of the solution and the quantity used. Although the weak solutions of duboisia paralyze the sphincter of the pupil, they affect the muscle of accommodation only to a slight degree. Complete paralysis of the ciliary muscle was readily produced by a solution of the sulphate of duboisia containing two grains to the ounce of water. It can also be produced by weaker solutions, but it requires a longer time and more frequent applications of the remedy. A slight paresis of the ciliary muscle was produced by a drop from a solution so weak that each minim represented 1-6000 of a grain of the alkaloid. Solutions weaker than this did not cause any observable change in the contractile power of the muscle of accommodation. A single drop from a solution, each minim of which represented about 1-1700 of a grain, caused slight paralysis of the ciliary muscle.

When one or two drops from a solution of the sulphate of duboisia containing two grains to the ounce were instilled into

the eye, paralysis of the ciliary muscle began to manifest itself in fifteen minutes. The paralysis gradually increased for one or two hours or longer. It usually required a second instillation to produce complete paralysis of this muscle. The duration of its effect on the ciliary muscle varied with the strength of the solution employed and the quantity used. When very weak solutions were employed the effect entirely disappeared within twenty-four hours; but when complete paralysis of the ciliary muscle had been produced, the muscle regained its contractile power only after an interval of three to five or six days.

In nearly all cases in which a two-grain solution of the sulphate of the alkaloid was employed, and of which four to six drops were used in each eye in the course of an hour, the following effects were observed: Rapid and complete dilatation of the pupil, paralysis of the ciliary muscle with loss of accommodative power, more or less retinal hyperæmia, dizziness, a staggering gait on attempting to walk, a certain degree of intoxication, confusion of ideas, a drowsy, sleepy feeling, flushing of the head and face, dryness of the skin, diminished salivary secretion, and in some cases marked dryness of the mouth and throat, slight elevation of temperature and increase of the pulse rate. In no instance did incontinence of urine follow its use, as in two cases reported by Dr. Little of Philadelphia. This may have been due to the fact that in only three of my cases were the toxic effects of the drug well marked.

A condensed report of two cases in which observations were made every few minutes may help to illustrate the general action of duboisia.

Case I.—Minnie S., aet. 18, of good constitution and general health, suffered from attacks of catarrhal ophthalmia, and pain and discomfort about the eyes after reading. She stated that formerly she had good distant vision, but that of late she had grown near-sighted. Vision = 12-200 in each eye, and was made worse by convex glasses, while with concave spherical glasses 1-24, she saw nearly 12-15 of Snellen's test types. Ophthalmoscopic examination did not reveal myopia, and a spasm of the ciliary muscle was suspected. Two drops of a solution of sulphate of duboisia containing two grains to the ounce were dropped into each eye. In four minutes the pupils began to dilate; in ten minutes they were widely dilated; in fifteen minutes the dilatation was *ad maximum*; in thirty minutes the duboisia was used again. The spasm of

accommodation began to yield, and in forty minutes Jæger No. 1 could be read with difficulty at nine or ten inches distant; in one hour she complained of feeling dizzy and drowsy, and fell into a light sleep soon after; in one hour and a half there was some confusion of the intellect, dryness of the mouth and throat, and she staggered when walking across the room. The face was flushed; the skin dry; the retinal and ciliary vessels were somewhat dilated; the pulse 66, full, but not particularly strong; respirations full and deep, and 16 per minute; temperature normal. At this time the spasm of accommodation had become so far relaxed that concave glasses no longer improved her vision; Jæger No. 10 could be made out with some difficulty. Three hours later, or four and a half hours after the drops were first used, she returned for a second *séance*, and reported that she had slept a little; but she was still a little drowsy and not very clear-headed. The drops were again instilled, and one hour after a + 1-60*s* ⊂ + 1-60*c*, axis 90° for each eye, enabled her to read 12-12. She came again next day, when the drops were used again for the last time, but no change in the condition of refraction was observable. The pupil remained dilated nearly a week, and the ciliary muscle regained its power a little sooner. Spasm of the ciliary muscle is not of frequent occurrence, and in order to overcome such spasm we formerly employed atropia for one or two weeks; but duboisia would seem particularly useful in such cases.

Case II.—Miss Belle K., aet. 22, of robust constitution and good general health, had suffered from blepharitis marginalis and from catarrhal ophthalmia. Thinking these were due to an error of refraction, I used the sulphate of duboisia to paralyze the muscle of accommodation. Two drops of a two-grain solution were dropped into each eye. The pupils began to dilate in six and a half minutes; in twelve minutes the drops were used a second time; in fifteen minutes the pupils were widely dilated, and there was beginning paralysis of the ciliary muscle; in 18 minutes the dilatation of the pupil was *ad maximum*; in 20 minutes paralysis of the ciliary muscle was well marked, and Jægar No. 12 was read with difficulty; in 40 minutes she could read Jægar 18, but not distinctly; in 45 minutes she complained of dizziness and of dryness of the mouth and throat. One hour after first instillation the drops were used a third time, making in all six drops in each eye. At this time there was evident dilatation of the ciliary vessels, and the retinal veins were considerably engorged. In one hour

and fifteen minutes the mouth and throat became so dry that she articulated with difficulty, and the face was quite flushed. In two hours the dryness of the mouth and throat became distressing, and she had become so vertiginious that I was obliged to assist her down the steps from my office. Three hours later she returned to my office, and by this time the vertigo and the dryness of the mouth and throat had in part disappeared, although she was still somewhat drowsy. She stated that after leaving my office in the morning her thoughts were so confused she scarcely knew whither she was going. The paralysis of accommodation was complete, and to prove this, applications of a four-grain solution of sulphate of atropia were then made to each eye. The atropia was used several times within three days, but no change in the power of accommodation could be detected.

In certain diseased conditions of the eye, duboisia is a valuable remedy, possessing all the merits of atropia, and applicable in cases where the latter proves irritating.

I have used duboisia in central perforating ulcer of the cornea, where dilatation of the pupil was necessary to prevent prolapse of the iris into the corneal opening. I have used it in acute iritis to dilate the pupil and relieve the pain, and in such cases the results were more satisfactory than those obtained from atropia. I think it dilates the pupil more forcibly, and relieves pain more promptly than does atropia. In phlyctenular ulceration of the cornea, where neither atropia nor eserine was well borne, the duboisia acted nicely, and greatly relieved the irritation and the spasm of the lids.

Duboisia may be used in almost any case in which atropia might be employed, and it should be used when the atropia produces irritation, as it sometimes does, or when from any cause the latter is not well borne. As in a case already related, it is particularly valuable in spasm of accommodation, as it produces the desired effect much more readily than atropia. For the purpose of making careful and accurate ophthalmoscopic examinations, particularly when the pupil is very small, weak solutions may be employed with advantage.

From its action on the intra-ocular circulation, the use of duboisia would seem to be contraïndicated in glaucoma, in choroidal inflammations, of whatever nature, and in inflammations of the retina; and it is also contraïndicated in peripheral perforating ulcer of the cornea.

In conclusion, I would add, that different preparations of the sulphate vary greatly in strength if we may judge from

their action on the pupil and on the ciliary muscle. This, no doubt, has led to the great difference of opinion existing in regard to the potency and the value of the drug. In a case in which I recently employed two different solutions on different occasions, this difference in the potency of the drug was remarkable. One solution, though used freely four times, produced none of the toxic effects of the drug; while the other solution, though used but twice, produced vertigo, loss of coördinating power of the limbs, drowsiness, and intense dryness of the mouth and throat.

RHEUMATISM vs. LEAD-POISONING.

BY J. J. MULHERON, M. D., PROFESSOR OF MATERIA MEDICA AND THERAPEUTICS IN THE MICHIGAN COLLEGE OF MEDICINE.

My purpose in this short paper will not be to enter into a disquisition on the conditions which the title places in antagonism, but rather to direct attention to certain points in each between which there exists a similarity which is apt to lead to confusion in diagnosis and error in treatment. If what I assume to be a fact shall prove such, I venture the opinion that its recognition will be a step forward in the treatment of a number of obscure and oftentimes rebellious cases. This assumption is that many conditions usually recognized as of rheumatic causation are the results of lead-poisoning. If it should appear that there is a similarity in the symptoms of the two conditions the presumption is certainly strong, from the great liability to lead-poisoning, that lead is too seldom recognized as the materies morbi.

It is not necessary to recount the symptoms of chronic subacute rheumatism. I shall content myself with enumerating some of the symptoms of saturnine impregnation. These are manifested chiefly in the nervous system, and are most frequent in those who have gradually come under the influence of the poison. Lead colic itself, occurring more frequently, in my experience, in those who have been more rapidly poisoned, is rather a nervous affection than otherwise. But lead colic, which when it does occur is certainly pathognomonic, is by no means a necessary symptom of the poisoning. In the insidious, and for a time unsuspected, poisoning the symptoms are very heavily masked. We have a losing of flesh and a flabbiness of muscle, accompanied by malaise and a

dullness of spirits, a lack of ambition, and gloomy forebodings, with a constipated condition of the bowels. How often this condition is diagnosed as "biliousness," and treated by a blue pill at night, to be followed by a dose of salts, sulphate of magnesia, in the morning, we have no means of ascertaining, interesting though the information would prove. This is the usual treatment in these cases, and fortunate he who follows it, for it usually checks in its incipiency what, if allowed to go on, would cause trouble. It is very fortunate for such cases that it is the popular custom to take a dose of salts in the morning to "carry off the mercury." The sulphate of magnesia is the best possible remedy for the lead-poisoning, relieving the intestines of what they may contain, and forming an innocuous sulphate with what remains. The physician, in prescribing thus, often prescribes wiser than he knows.

If, however, the trouble is not thus accidentally or otherwise nipped in the bud, a sickly pallor of the countenance ensues and darting pains are felt in the thighs and legs, or in the arms and chest, the constipation of the bowels continuing. There is, also, usually, some gastric disturbance, and vomiting is not an infrequent occurrence, especially in the morning. The pains continue and finally become more permanent, settling more generally, with greatest severity in the legs. They are usually intensified at night, from which fact, especially if the patient have ever "sported with Venus and afterwards been punished by Mercury," syphilitic periostitis has been sagely diagnosed. Should the victim not yet have consulted his medical adviser he now does so, and the chances are that rheumatism is diagnosed and he is put on the commencement of the interminable list of "sure cures." The list is proceeded with, but the symptoms know no abatement until, finally, throwing medicine to the dogs, the patient goes to either the Mount Clemens, or Sandwich, or some other sulphur springs, and is cured. This is no mere fancy sketch; I speak from actual observation.

In the winter of 1877 I was consulted by Mrs. P., who had come to see me after she had seen many others without relief. She complained of pains which had led her to be treated for rheumatism. I made a careful examination of her case, and although there were some points in it which would not point to rheumatism, I was unable to come to any other conclusion than that she was suffering from that affection in its chronic form. Inasmuch as she had been treated by thoroughly competent physicians, I concluded that she had taken the usual remedies, and instead of prescribing further internal medica-

tion, advised her to go to Mount Clemens and take a course of sulphur baths. She did so as soon as the spring opened and the weather became sufficiently warm, and returned home in about three weeks thereafter entirely free from her pains. The case made a strong impression on me, and led me to look fully into the relation between the springs and the cure. The patient informed me that the attendant at the springs remarked to her that the black deposit on her surface after each bath was unusually heavy, and that it was "the disease coming out." I had never been inclined to much faith in the sulphur springs, on theoretical grounds, as a remedy against rheumatism, and was disposed to regard the diaphoresis brought on by the hot baths as the relieving cause, rather than the sulphur. This case suggested another possible method in which they relieve those who apply to them. It struck me that the black deposit was a plumbic sulphide, the base of which was supplied by the system, and that the baths had worked a cure by assisting the elimination of lead. An examination of some of the cooking utensils in the lady's house by the nitric acid and potassic iodide test revealed the presence of lead. This evidence, though not conclusive, was suggestive, and I determined to suspect lead in the next case, with similar symptoms, which I might meet.

Since then I have had but one other case of this nature, but it furnished such direct testimony in support of the suspicion aroused by the above case that I submit it as the basis of the assumption made in this paper.

John T., saloon-keeper, German, aged 37, came to see me last summer. Had complained of fugitive pains through his lower extremities for over a year, but found, through experience, that a few glasses of lager would relieve them. Latterly, however, the pains had become more severe and constant, and his favorite beverage not seeming to relieve as formerly, he concluded to consult a physician. I found him suffering from the pains indicated, and at the time of my visit they were so severe as to prevent his moving around. The absence of fever, and the appearance of the tongue and complexion, led me at once to suspect the presence of lead. On inquiry I ascertained that it was his custom on opening his saloon each morning to regale himself with a draught of lager from the keg, between which and the point of exit of the fluid into the glass, there ran a lead pipe. An examination of the first glass of beer drawn in the morning revealed the presence of lead. I placed the patient on the sulphate of magnesia for a few days, and afterwards on the iodide of potassium. The relief was quite

marked, but recovery from the cachexia did not follow, and I advised a resort to the sulphur springs at Sandwich, opposite Detroit. The deposit of the sulphuret of lead on the patient's surface after the first few baths was very heavy, but after six baths had been taken it began to grow markedly less, and in a few weeks the relief from the pain and other symptoms, some of which reminded one very forcibly of rheumatism, was complete.

I report these cases with a view to directing attention in the direction indicated. Considering the great liability to lead-poisoning, and the similarity between its symptoms and those of rheumatism, is it not possible that errors in diagnosis, and consequent errors in treatment frequently occur?

OPHTHALMIA NEONATORUM.

BY EUGENE SMITH, M. D., PROFESSOR OF OPHTHALMOLOGY, MICHIGAN COLLEGE OF MEDICINE, DETROIT.

MR. PRESIDENT AND GENTLEMEN:—Appreciating the desirability of practical papers on such occasions as this, particularly when treating of subjects pertaining to the domain of specialism, I have chosen the subject which I present to-day because it is one of very great interest to the general practitioner; one of great danger to the patient when not properly treated; one which is very amenable to treatment; and one not infrequently met in the practice of the physician. I allude to Opthalmia Neonatorum, the inflammation of the eyes of new-born babies, which usually shows itself three or four days after birth. The lids become greatly swollen and red, and a thin, clear, yellowish liquid flows out when the lids are forcibly opened. In a day or two the discharge changes to a thick, creamy yellowish-green, and is quite copious.

Generally the cornea does not become implicated under ten days, and as the danger to the eyes *depends* upon the cornea becoming affected, there is sufficient time to get such control of the case as to prevent the loss of eyes, which, I do not hesitate to say, should *never* occur, and never does occur when proper remedies are properly applied before the cornea becomes ulcerated.

It is not my intention to take up your time with an account of the causes, symptoms, sequelæ, etc., for I take it for granted most of you are conversant with them. The proper method of treating these cases, however (I am satisfied from the many cases I have seen during the past year), is not as well understood by general practitioners as it should be,—a fact which, I think, is due to the text-books on medicine and surgery, all of

which give a similar method of treatment, a sample of which I take from "The Principles and Practice of Surgery, by Hamilton," which is as follows: "Cleanliness, good nourishment, the application of muslin cloths moistened in tepid water, and mild astringent collyria, have never failed in my experience to bring the inflammation to a close within from one to three or four weeks, and without any permanent impairment of vision. Simple rose water is often sufficiently active, or with the addition of one grain of the sulphate of zinc to three or four ounces of the water. Nitrate of silver is an agent of too much energy to be employed on tissues so young and delicate, and I have more than once seen the eye destroyed by its use in these cases."

This is a fair sample of the advice of various authors.

Now, as we have two forms of the disease, both usually accompanied with great swelling of the lids, but one mild and catarrhal in character, the other severe and purulent, I am inclined to think that the cases which do not recover with the mild treatment very soon seek a specialist, and authors have supposed *all* cases to have recovered with the mild treatment. I believe from personal experience, and the fact that most authors reside in large cities, where specialists are also found, that I am justified in the above belief.

That these cases may be made blind by the improper use of nitrate of silver no one can doubt, but that it is of "too much energy" when properly used is a mistake, and one which tends to mislead.

It is but a short time since a beautiful babe was brought to me from an interior city with one eye destroyed, and the other doing poorly, in which the *mild* treatment as above given was very fully carried out by an intelligent physician. I hold that the loss of eyes from this variety of inflammation is either due to *no* treatment at all, or to such treatment as I have quoted, and that the advice to so treat such cases is founded on mistaken ideas or limited experience.

The method of treating these cases which is advised by specialists, and which in their hands is always successful if the case is seen early, is essentially the same. As I treat them, the method is quite simple, requires no special skill, and its effects are so prompt as to be somewhat surprising to the parents as well as to the physician who for the first time supplements it for the so-called mild treatment where the syringe is used, perhaps, to cleanse the conjunctival sac every 15 minutes or half hour, and the remedies as frequently applied. It seems to me that this is contrary to well-known surgical rules

regarding rest of inflamed parts. In this way the eyes do not have time to recover from the irritation incident to one treatment before the next application, and abundant experience during the past twelve or fifteen years has taught me that the application of astringents or caustics to the conjunctiva oftener than twice in the 24 hours is entirely uncalled for in any form of ophthalmia.

The necessity for washing the discharge from the conjunctival sac will be entirely obviated by keeping the edges of the lids well annointed with some bland ointment; and this point is, next to the proper application of the remedies, the *most important.*

Although I occasionally use the mitigated stick of nitrate of silver, in most if not all cases a five grain to the ounce solution of nitrate of silver applied to the *everted* lids twice a day, first gently wiping off the discharge from the palpebral conjunctiva with a piece of very fine old linen, or allowing a stream of warm water to flow on to the everted lid from a sponge, will suffice to cure the disease in from two to four weeks.

If the lids are kept well annointed with unguentum petrolei, the discharge flows out upon the cheek and may be wiped off as frequently as is necessary with a bit of soft linen, the lids being greased after each wiping off of the discharge; in this way the retention and decomposition of the discharge in the conjunctival sac is obviated.

To sum up, then, the plan of treatment which will always prevent the loss of vision in ophthalmia neonatorum, is to evert the lids, wipe off the discharge from the conjunctiva, apply several drops of a five-grain solution of nitrate of silver morning and evening, prevent the agglutination of the edges of the lids by keeping them continually annointed with some bland ointment, and wipe off the discharge from the cheek and eyelids as often as is necessary.

REPORT OF THE COMMITTEE ON SURGERY.

BY T. A. M' GRAW, M. D., DETROIT, CHAIRMAN OF THE COMMITTEE.

MR. PRESIDENT AND GENTLEMEN:—The field of medical journalism has become of late years so extended, and the information which it conveys to the profession is so recent, copious, and exact, that it has become almost impossible to broach any subject to a society like this with which its members are not already acquainted. This is especially true of general surgery, which has ever been a favorite with American physicians. Your Committee have, therefore, felt embarassed on account of the difficulties in the way of performing their duties satisfactorily. To repeat stale news would be tedious; to discuss intelligently disputed theories would take more time than is at their disposal. They have, therefore, concluded to consider rather the general results due to advances in surgical knowledge than to dwell upon its minute details, and to discuss especially the influence which the newer developments of science have had upon the profession itself.

In a recent lecture Prof. Spence, of Edinburgh, called attention to the effect of the introduction of Anæsthesia on the popularization of operative surgery in the profession. Operations had previously been monopolized for the most part by a few surgeons in the larger centres of population. The mass of the profession had neglected to inform themselves even theoretically in the principles of operative surgery. The elimination of the element of pain caused an immediate revolution, and professional ambition, no longer repressed by humane scruples, everywhere seized upon the hitherto neglected art as

the stepping-stone to honor and fortune. In America, our late war had a similar effect. It gave opportunity to practice surgery without any such personal responsibility as would have attended the same practice in civil life. The close of the war, accordingly, found a vast number of ambitious operative surgeons, armed with experience, eager to seize upon the laurels and emoluments of civil surgery. There has probably never been an age, or a nation, in which operations have been so generally practiced by the whole profession as in this nation since the war.

There are noticeable, however, certain tendencies which threaten to transfer the control of many branches of surgery from the general profession to specialists. Dentistry is already completely divorced from the profession, excepting as the country or army surgeon draws an offending tooth. Ophthalmology is becoming fast as thoroughly special as dentistry; and Laryngology is pressing its claims to the exclusive surgery of the throat. Apprœcology has fallen largely into the hands of a select few, who seem disposed to resent any encroachment upon their special province as a personal injury. In certain operations, indeed, like ovariotomy, they boldly claim exclusive rights on the plea that he who can not operate often can not hope to achieve the best success,—a plea which, if once admitted as valid, would, it must be observed, wipe out of existence every practitioner of surgery who did not enjoy the hospital practice of a large city. The assumptions of specialists have been so far admitted by the general profession, that many good men hesitate to practice in certain fields, either through distaste or through fear of the censure of those who claim to be better informed.

It is both to the laity and the profession an exceedingly important question how far the profession should yield to this tendency. Is it better that the family physician should practice all branches of surgery, or does such practice prevent a greater good which would come from the multiplication of special students and observers? Is it wise for a medical man to abandon altogether any field of practice or to neglect the acquirement of that knowledge which would make it possible for him to practice any part of the medical art? In short, is it our duty to repress specialism or encourage it, and if the latter, to what extent?

As regards the community, these questions must be decided on the basis of the greatest good or greatest evil. Has it, on the whole, been a gain to the people that the profession everywhere have practiced as operative surgeons?* Remember-

ing that incompetent and dishonest men are everywhere an evil, whether acting as physicians only or also as surgeons, there can be no doubt that the honest endeavor of the trustworthy men in the profession to meet the requirements of their patrons in surgical cases has been of great advantage to those patrons. This will appear evident on but a moment's consideration. There are a thousand and one emergencies constantly happening in every-day practice which require immediate and skilled attention. The wounded artery must be tied at once, and tied properly; the compound fracture or dislocation must be dressed thoroughly and without delay; the strangulated hernia will not always permit men to run to a great city for help; the extravasted urine must be speedily evacuated or the resulting sloughing will destroy what years cannot replace. Who has not met such cases in practice, and who will not recognize the importance of having skilled practitioners in every village to treat them promptly and properly? And yet your committee will venture to assert that the men who are qualified to meet such emergencies with courage, nerve, and proper judgment, are also able, if they choose, to operate for cataract or ovarian tumor. But it is not only for such cases that the home talent is better than foreign. The family physician who esteems it his duty to practice surgery will prevent many maladies from becoming incurable. He will excise the suspicious lump in the breast of his patient and rescue her from cancer. He will recognize the import of a slight limp, and apply the treatment for hip disease in its earliest and most curable stage. The acute inflammation of periosteum or bone will be relieved by the free incision which will save his patient from years of necrosis.

On the other hand, many chronic diseases require such protracted treatment that the long absence from home, when aid must be sought at a distance, becomes burdensome and often impossible. In chronic diseases of the joints, where treatment must be continued for years, the expense of distant advice is often such as to impoverish a family. Poor people with such maladies must get well at home or, in very many cases, not at all. Even with many well-to-do people their removal from home, the discomforts of strange life, and the rupture of long-established habits, are often more than they can bear. Add to this the fact that the pure air of many country homes is often the very best for the treatment of surgical cases, and we have very many grounds for insisting upon the superior benefit of home surgery whenever it can be attained.

These considerations, in the opinion of your committee,

make it not only praiseworthy for, but even obligatory upon, all family physicians, and especially such as are isolated from other practitioners, to qualify themselves to treat at least such surgical cases as can not get other aid.

If surgical practice on the part of the general practitioner is thus advantageous to the community, it is no less so to the physician himself. Putting aside the reputation and emoluments which arise from successful surgery, the practice itself teaches many lessons, not only of courage and presence of mind, but also of pathology. The study of vital processes in wounds is neccessary to the proper comprehension of internal diseases. The diseases of the abdomen, for instance, can never be so thoroughly understood by the mere physician as by him who has also witnessed its surgery. The surgeon who has performed ovaritomy, cut down upon a cæcal abscess, or operated for hernia, has learned many things which would never have come to him in any other way. There can be no question that the practice of surgery adds vastly to the experience, skill, and mental development of the general practitioner. The limits of special practice, on the other hand, tend inevitably, to a certain extent at least, to dwarf the man. What he gains in technical knowledge he loses in grasp of principle. That a certain advantage accrues from the devotion of certain men to limited fields of practice is indeed self-evident. Such men acquire the most intimate acquaintance with the technicalities of their special branch.

No one could wish for a moment to see dentistry re-absorbed into the general profession. Success in that specialty depends almost wholly upon the familiarity of the operator with a great number of minute and special processes. It must be remembered, however, that dentists have ceased to be physicians, and that no other branch of practice can bear so well to be divorced from general medicine. Should the time ever come when diseases of the eye and ear, or throat, should fall into the hands of men who could claim to know nothing else of the medical art, it must necessarily be a time of decadence in medical science, for no merely technical skill could compensate for the loss of the knowledge and appreciation of those constitutional conditions, which affect more or less all organs of the body. The peculiarity of dentistry is that the constitutional causes of dental caries act long before the patients present themselves for treatment, and the dentist for the most part has to repair the ravages of spent diseases.

It is not, as we believe, difficult already to discern in our periodical literature, in the writings of special practitioners,

that exaggerated estimate of the importance of slight maladies and that improper and partial appreciation of local symptoms which proceeds from habitual limitation of observation and thought. Take, for instance, the matter of ruptured perineum. Who is there that practices midwifery who cannot recall women, almost by the dozen, who have been ruptured even to the verge of the anus, and who have been ordinarily healthy and well for years afterwards,—as long, in fact, as they have been kept under observation? Who is there that practices gynæcology that has not operated successfully for laceration of the perinæum, reëstablished the whole perineal body to perfection, and then been disappointed in the obstinate persistence of the old back-ache, bearing down pain, vesical irritability, and other symptoms, to cure which the operation was performed? With such experiences, what is the profession to think of the assertion of certain gynæcologists that even the slighter forms of laceration must be held responsible for many of the worst sufferings of women, and should be sent forthwith to the expert for operative treatment? Truly it is important that the narrower experiences of special practice should be modified by the wider lessons of general medicine. No less for the good of the specialist himself than for that of the whole profession, is it proper that an intelligent criticism should meet the efforts of every man who seeks in any branch to introduce novelties in theory or practice.

Whatever fields the general profession may choose to yield to the specialist in practice, this right of criticism they should never abandon. But how can any man hope to criticise intelligently an art that he has never practiced and of which he has only the most superficial and general knowledge?

For all concerned, therefore, it is better that the family physician should practice surgery in all its branches. The community need the skilled aid at home, where it is accessible. The profession require the intelligent coöperation in all projects for professional progress, and he himself should have the training and experience, without which he must be of necessity a one-sided and deficient practitioner. Who of us is there who does not feel cramped in his professional activities by just such deficiencies.

The real question, therefore, is reduced to one of ability. *Can* any one man hope to master all the branches of his profession? Let us look a moment at the obstacles which prevent medical men from engaging in certain specialties,—say Ophthalmology or Laryngology.

Before the year 1857, when Helmholtz invented the ophthalmoscope, diseases of the eye were as much a part of general surgery as those of the leg. It would not be hazardous to say, that the difficulties experienced in learning to use a novel and peculiar instrument have more than anything else deterred the general profession from attempting to qualify themselves in the treatment of ocular diseases. It is true that the study of the abnormalities of form, as evidenced in improper refraction, requires more mathematical knowledge than is demanded by general surgery. Such cases, however, requiring, as a rule, no hasty treatment, and seldom endangering the eye, could be easily disposed of. The real difficulty is that the average practitioner, unaccustomed to ophthalmoscopic investigations, regards them as more difficult than they are. The ophthalmoscope is a barrier before which he comes to a halt in his practice. The same is true of the laryngoscope, whose use has rendered it possible to create a specialty out of the diseases of the throat. If the vocal cords were normally so exposed that we could look upon them without artificial aid, who can doubt that all their ailments would be treated like those of the mouth by the general practitioner?

Now as far as the use of these instruments is concerned, it is continually demonstrated in those colleges where students, in the pursuance of their studies, are required to pass through a drill in the use of every clinical instrument, that the daily practice of a month will enable men to see all that can be seen by their aid, so that they can intelligently describe the picture which they have looked upon. We do not, of course, imply for a moment that they can in any such time learn to interpret accurately the phenomena, but that they learn to use the instrument properly and to see through it. Now when we consider that the ophthalmoscope nowadays is used not only to diagnosticate ocular diseases, but also diseases of the brain and general system, we can hardly hold the general practitioner excused from using it on account of difficulties which three weeks' practice would overcome. As concerns the treatment of eye or throat diseases, that of many of them is simple and can be done at home as well as or better than in a city. Those cases, indeed, which require operative interference may properly be sent to the special surgeon, if the family physician feels himself, whether through lack of nerve, or experience, or instruments, incapacitated for their proper care; but we must earnestly protest against the idea that he who feels himself competent lies under any moral obligation whatever

to refrain from operating if he gets the chance. What would become of the profession if only skilled operators, with long lists of successful cases, were to be allowed to operate?

The cost of instruments is undoubtedly a great obstacle to the popularization of operative surgery in the profession. This is getting to be worse every year, on account of the great number of new instruments invented for special purposes. The surgeon who would keep pace with the daily instrumental improvements may easily spend from one hundred to one thousand dollars per annum in instruments. Men in small surgical practice can hardly afford to purchase a Bigelow's apparatus and lithotrite for an occasional case of stone, or an electric cautery battery for a single polypoid tumor, or a large aspirator for an abscess in a pauper's thorax, or any costly apparatus which he may never have to use but for the one occasion. This necessary outlay will always hinder the development of operative surgery in small centers. Besides this, new methods of operating have been introduced which demand much more of the surgeon's time than was formerly required. Whatever else may be said of Lyster's antiseptic treatment, it is not true that it can be applied properly without great expenditure of time. In a hospital, indeed, where trained assistants have everything ready, everything passes off marvelously quick, but in private practice the time consumed in getting the spray apparatus alone at work would be sufficient under the old system to have dressed the wound and departed. The antiseptic method, too, demands greater watchfulness on the part of the surgeon, as the dressings must be changed the moment indications arise of threatened exposure to the ingress of septic germs, and especially as they must always be attended to by the surgeon himself or a trained assistant.

The operator may no longer delegate the dressing of wounds to nurses or friends. In certain operations, such as ovariotomy, if we follow the strict antiseptic precautions of some of the German surgeons, we find that the preparation for an operation is a very formidable affair. Immediately before the operation the operator takes a complete bath, changes all his clothing in order that no chance germ from a previous case of erysipelas, puerperal fever, or like contagious disease, may poison his patient; he requires all his assistants and all the bystanders to do the same; has the operating room thoroughly and carefully disinfected, as likewise all the sponges, instruments, dressings, etc. The success of ovariotomies and other cases of abdominal section under these precautions has been something wonderful, and if future experience should not

prove them to have been merely coincidental, it will become obligatory upon every surgeon to do likewise. Imagine the revolution which the adoption of such a course would cause in American practice. Should the antiseptic system prevail—and it is now on its trial—it will almost of necessity force the operating surgeon out of general practice, for no man who is liable to be called at any hour to cases of typhoid fever, puerperal fever, scarlatina, measles, and the like, can have it in his power to comply with such strict rules; for it must be remembered that the procedure is not one simply of cleanliness. It will not do for the practitioner to bathe in the morning early, and after visiting several patients and becoming perchance contaminated, to operate at noon. He must go to the operation as absolutely free from all contagion as if life hung upon the very dust in the air. Looked at in this light, the eventual fate of Listerism would seem to be one of great import to the profession, as for reasons which we have only hinted at, its success under its present form would seem to carry with it the necessity for divorcing operative surgery almost completely from family practice. Some simple method of killing Bacteria may be invented, however, which may be made available with less sacrifice of time and labor.

With a certain few operations the technical difficulties are so great as to render necessary a long course of special study and experience. Vesico-vaginal fistulæ, cleft palate, extroversion of bladder, cancer of the larynx, and other similar morbid conditions will, from the inherent difficulties of the operations for their cure, rarely be touched by the general practitioner, as the time and study demanded for successful treatment can, with most medical men, be more profitably devoted to other matters. They will fall properly into the hands of those who have devoted especial attention to their pathology and cure. For the treatment of these cases and those others which have been unsuccessfully treated at home, or which have come to the larger cities by virtue of that rule which makes men seek superior skill among strangers, specialists will always be needed and will always be useful.

But looking over the whole field of surgical labor, your committee have been unable to come to any other conclusion than that it is for the most part perfectly accessible to every man in the profession. It may not be possible to master all the minutiæ of all the departments of surgery, but the principles upon which depend all special practice may be grasped by every physician who couples average intelligence with industry. Those who are not able to operate with success on cataract or

vesico-vaginal fistulæ or ovarian tumor, may at least render themselves able to judge intelligently when such operations have been properly attempted. They may also be made so far capable of judging of specialists and their inventions as to know whether certain work has been performed for the good of the human race or for individual advertisement.

He who enters his profession properly trained should have a comprehensive idea of it. It is our methods of instruction which are at fault, and which have by no means kept pace with the growth of surgery.

What are we to think of our present system of medical education, when, in the face of the recent enormous acquisitions to our knowledge, scarcely more is required for graduation than was thought necessary thirty years ago?

What are we to think of metropolitan schools which, claiming to be the best in the land, and attracting to their doors our best educated and brightest youth, confer their diplomas upon candidates who have never made a chemical analysis, never looked through a microscope, and are practically ignorant of all histology; who have never heard the sounds of the human heart, nor looked through an ophthalmoscope into the human eye, nor seen the living vocal chords, nor felt the fluctuation of an abscess, nor, in short, had any real experience in any part of their profession excepting in the one matter of practical anatomy? The very foundations of the scientific surgery of to-day lie in the so-called unpractical branches of chemistry, physiology, histology, and morbid anatomy. How many of our schools require practical laboratory courses in these branches? Is it not notorious that in the majority of American colleges all that the student learns of chemistry is acquired as he sleeps through lectures that he does not understand, that his histological course is practically *nil*, that his physiology is taught him only by a course of didactic lectures, and that his knowledge of morbid anatomy is confined to a dim remembrance of a few dirty trays which have been passed around the class to distract his attention from his lectures? Is it not notorious, too, that students of these schools who would learn anything of these things must pay large extra fees for the privilege, and take extra courses?

If the science of surgery is thus neglected in the schools which profess to teach it, what shall we say of its art? In New York and Philadelphia the clinical facilities are enormous. There is no doubt that a pushing youth with plenty of money may force his way into dispensaries and hospitals where he may see, feel, and smell all that is apparent to the senses

in the way of clinical surgery. But how does it fare with the mass of students, who are strangers in a big city, and whose means will not allow them to deviate far from the regular catalogue programmes of lectures and clinics? Packed in immense amphitheaters, they are taught surgical diagnosis on patients whom they are never permitted to touch and whom they can barely see from afar off. The clinical patient is brought before them once or twice,—once if he dies or if the treatment is unsuccessful, twice if the result is satisfactory to the surgeon,—but the daily changes in healing and the daily care of wounds are never witnessed except by the chosen few who are able to pay extra fees for extra advantages. The average student is expected to learn how to distinguish fluctuation in an abscess or crepitus in a fracture by watching from a distance of forty feet the eminent surgeon, who tells him how they feel. We hazard nothing in saying that the mass of graduates from our largest schools get their diploma without even having had a clinical drill of any value in any one department of surgery.

As far as gynæcological surgery is concerned, indeed, its practical study by undergraduates is in many large schools positively discouraged, under the peculiar idea that vaginal examinations are proper only to those who already know how to make them. It is assumed, of course, that the moment the degree is conferred the candidate, by some mysterious process, becomes at once proficient, though a few hours previous his knowledge may have been of the vaguest kind.

Is it wonderful, Mr. President, that with this sort of training the physician neglects in after years to render himself generally competent? Your committee submit for your consideration two propositions: 1st, that the growing tendency in the profession to neglect those branches of the art of surgery which they delegate to specialists is an injury to the people as well as the profession; and 2d, that the prevailing incapacity to practice successfully in all departments of surgery, is to be ascribed *not* to inherent difficulties, but to the lamentable lack of proper training of physicians previous to graduation.

The science and art of surgery have grown into proportions which our fathers never dreamed of, but we expect young men to master it in the time and with the instruction which our fathers demanded for it in its infancy. The most urgent need in the profession is the thorough regeneration of its schools. Students before graduation should be instructed at least in the rudiments of their profession; they ought, at

least, to enter the profession on a basis of practical knowledge which will permit of growth in after years. But this cannot be hoped for unless a radical change is made, not only in the quantity but in the quality of instruction. No longer ought medical colleges to be encouraged or allowed to confer degrees after two meagre courses of didactic lectures. The inadequate plan of didactic teaching must give way to that thorough drill and practical work in the dissecting rooms, laboratories, and hospitals, which alone can make the student understand the demands of his profession.

A few medical colleges, Mr. President and gentlemen, have abandoned the old plan of teaching for a new one of greater promise. It is a credit to Michigan that every one of her medical schools stand committed to the higher education of medical men.

In Michigan it will be henceforth impossible for any man to enter a medical college who has not passed a certain preliminary examination, nor to graduate until he he has attended three courses in three years and in graded classes.

Now that Michigan colleges have taken this step in advance, is it too much to ask of the profession of Michigan that they, too, shall pledge their support to the new movement by promising to encourage the schools which adopt it and to refuse utterly any support to such colleges as prostitute their office by turning loose upon the profession an annual flood of ignorant M. D's.

REPORT ON THE WORK OF THE STATE BOARD OF HEALTH.

BY H. O. HITCHCOCK, M. D., KALAMAZOO, MEMBER OF THE BOARD.

MR. PRESIDENT AND GENTLEMEN OF THE STATE MEDICAL SOCIETY:—The intimate and dependent relations of the State Board of Health to the medical profession of the State make it important, in the minds of the members of the Board, that a delegate should represent it in this, by far the largest, organized body of the profession.

The purposes of the Board are, as specified in the act creating it, "to study the vital statistics of this State, and endeavor to make intelligent and profitable use of the collected records of deaths and of sickness among the people, and to make sanitary investigations and inquiries respecting the causes of disease, and especially of epidemics; the causes of mortality, and the effects of localities, employments, conditions, ingesta, habits, and circumstances on the health of the people." All of these purposes look almost entirely to the *prevention of disease* among the people, while the purposes of the medical profession look very largely to the *cure of disease*, and but incidentally to its prevention.

The very nature of the purposes of the Board left it out of and above the field of the active, constant, and many-sided strife of the pathies, because, as a board of health, it does not concern itself with the practice of medicine, nor with the theoretical or practical action of remedies on the various diseases. Hence it can, does, and ought to coöperate with, and receive the coöperation of all individual members, and all organized societies of the profession in its means and measures for the prevention of disease.

The Board is very largely dependent upon the medical profession, both for the abundance and accuracy of its facts concerning the cause, the nature, the prevalence, and the mortality of certain diseases and epidemics, and also for the efficiency with which its measures for the prevention of disease are carried out among the people.

The "health laws" of Michigan, decidedly in advance of those of many of her sister States, provide for a local board of health in every city, village, and township of the State, and require that each and every local board should elect some person to act as *health officer* for that city, village, or township. As the health officer is likely to be a medical man wherever it is practicable, and as the health officer is or ought to be, the executive man in his own local board, and as the law requires that the health officer shall at least once a year report to the State Board "on blanks and in accordance with instructions received from the State Board," it follows very clearly that *it really rests with the members of the medical profession of the State to determine how full and exact shall be that class of statistics which the law requires the State Board "to study and to make profitable use of."*

There are nearly 1,300 local boards of health in the cities, villages, and towns of the State. Complete and accurate reports from all of these concerning the epidemics and endemics and contagious diseases which have prevailed in their vicinity for any single year, with careful observations as to their causes, history, and mortality, would present a mass of facts to the State Board which its efficient and painstaking Secretary, or its committees, might study with a certainty of making such deductions from them as would be of "profitable use" to the people.

The law has made it the duty of the Secretary to "prepare blank forms of returns and such instructions as may be necessary, and forward them to the clerks of the several boards of health throughout the State," and to "keep and file all reports received from such boards."

The same law says "It shall be the duty of the health physician, and also of the clerk of the local board of health in each township, city and village in this State, at least once in each year, to report to the State Board of health their proceedings, and such other facts required, on blanks and in accordance with instructions received from the State Board." For the last five years such "blanks" with "instructions" have been prepared by the Secretary and sent to the health officers and clerks of all the local boards, and for four years

at least the reports returned from these officers have been filed and laid away in the office of the State Board at Lansing.

As the Committee on Epidemics, Endemics, and Contagious Diseases, it occurred to me that these reports from the local boards should be "studied and made profitable use" of in compliance with the law.

I proposed to make a full, careful, and well digested report concerning the epidemics, endemics, and contagious diseases in Michigan for the year 1879, to be gleaned from and based upon the reports from health officers and clerks of the 1,300 local boards of health in the State now on file. I communicated my purpose to the Secretary, and was surprised to receive a line from him in which he suggested a doubt as to whether the reports named were sufficient in number, completeness, and accuracy to make such a report as I suggested reliable and valuable.

I was, however, still more surprised to examine two reports of health officers for that year which Dr. Baker caused to be sent to me as fair specimens of such reports.

One of these was very full, and was evidently made out by an intelligent and faithful health officer, and with 1,299 other reports of equal fullness and accuracy would form the basis of a report such as I contemplated, which would be of great use to the profession and to the people; but the other report was absolutely of no value at all, hardly any of the blanks being filled out,—it would in the generalization vitiate or neutralize the good report.

I was compelled to agree with the opinion of Dr. Baker as to the value of the accumulated reports for that year, and to abandon my purpose. I now learned that very many health officers made no report at all to the State Board, utterly ignoring the requirements of the law on that point, while many others made the most meagre reports possible upon blanks sent them by the Secretary.

Is not this an evil largely chargeable to and remediable by the medical profession? I appeal to the members of this Society who are or may be health officers to see to it that full and reliable statistics are furnished the State Board by their annual reports, and then to demand that those reports be "studied and made profitable use of" in compliance with the law.

But in many instances the health officer cannot make reliable reports to the State Board because the facts are not given to him by the physicians in his territory. The law makes him a recipient of other men's facts and observations which it

very properly, and with penalties attached for non-fulfillment, requires them to communicate to him. But many physicians seem to think that law is more honored in its breach than in its observance, and utterly ignoring its requirements keep to themselves the facts which they ought to communicate to the health officer,—facts which would enable him to make a complete report to the State Board, and which would furnish to that body material which they could "study and make profitable use of."

Thus it appears that the failure of the State Board to get complete and accurate statistics of the diseases and mortality of the State is chargeable in *some measure* to those physicians who act as health officers and who neglect to comply with the law, and in *large measure* to those physicians who neglect to report cases of contagious diseases to the health officers of their localities.

As an offset to the foregoing complaints, it can be said that the Board has received very excellent and efficient help in its work from many physicians who have voluntarily acted as correspondents of the Board. From this source many excellent suggestions and papers are every year received, which add not a little to the interest and value of the annual reports of the Secretary.

There is another way in which the Board is largely dependent upon physicians; they are really the medium between the Board and the people through whom many of their circulars and suggestions must reach the people, and be made practically useful to them. The circulars on the restriction and prevention of scarlet fever and diphtheria, for instance, if approved and acted upon by physicians would, it is believed, very largely decrease the mortality from those diseases, and to a large extent limit their spread. But if those circulars, or the facts and principles in them, be neglected or ignored by physicians, they fail in equal measure to be of practical use to the people.

Of so much consequence have we deemed the practical and efficient coöperation of physicians with the board in the accomplishment of its purposes, that we have presented for discussion and approval of this Society the following resolutions:

Resolved, That in the opinion of the members of this Society, the laws of the State requiring physicians to report to the local board of health, or to the health officer of their locality, all cases of sickness and death, of diseases contagious or dangerous to the public health, are wise and proper, and ought to be complied with.

Resolved, That the law requiring health officers and clerks of local

boards of health to make yearly reports to the State Board of Health on blanks furnished them by the Board, is just and reasonable, and necessary to the most efficient work of the State Board, and that no physician should accept the office of health officer who does not intend to comply with the law.

The following list of papers will appear in the Annual Report of the Michigan State Board of Health for 1879, soon to be published:

1. A Historical Review of Legislation relating to Inspection of Illuminating Oil in Michigan: Annual Address of Robert C. Kedzie, M. D., President of the Board.
2. Privies and Water-Closets at Railway Stations: By Homer O. Hitchcock, M. D.
3. Report of Attendance at the Meeting of the Sanitary Council of the Mississippi Valley, May 5-9, 1879; and at the meeting of the National Board of Health at Atlanta in May, 1879; and at the Section on State Medicine and Public Hygiene in the American Medical Association at Atlanta in May, 1879: By Prof. R. C. Kedzie, M. D.
4. Regulation of the Practice of Medicine: A Report by Hon. LeRoy Parker.
5. Methods of Heating and Ventilating Private Dwellings and Public Buildings already constructed: A Report by Rev. Daniel C. Jacokes, D. D.
6. Report on Slaughter-Houses, Rendering Establishments, etc.: By Homer O. Hitchcock, M. D.
7. Sanitary Associations: By John H. Kellogg, M. D.
8. Waste of Human Life,—a Communication relative to the falling of the grand-stand at the Lenawee County Fair at Adrian, Oct. 2, 1870, and to the wrecking of the Pacific Express Railroad train near Jackson, Oct. 9, 1879: By Prof. R. C. Kedzie.
9. Report of the Committee on Epidemic and Contagious Diseases: By Homer O. Hitchcock, M. D., Committee.
10. Opinions relative to Duties and Compensation of a Health Officer, by Hon. LeRoy Parker, Member of the Board; by G. Chase Godwin, City Attorney of Grand Rapids; and by Hon. Otto Kirchner, Attorney General: Prepared for publication by Mr. Parker.
11. A Paper relative to Diseases in Michigan during the Year 1878: Compiled in the office of the Secretary from Replies by Correspondents of the Board to Circular 29.
12. The Reclaiming of Drowned Lands: By Henry F. Lyster, A. M., M. D.
13. Circular 34, relative to Notices of Diseases which endanger the Public Health; Duties of House-holders, Physicians, etc.
14. Circular 35, relative to the Work of Health Officers and of Local Boards of Health in Michigan.
15. The Water Supply of Localities in Michigan and its Relations to Health and Disease, being replies by Regular Correspondents to Circular 7, arranged for publication by the Secretary.
16. The Powers and Duties of Local Boards of Health: By Hon. LeRoy Parker.
17. Report on Glanders in Man and in Domestic Animals: By Henry B. Baker, M. D.

18. The Principal Meteorological Conditions in Michigan during the Year 1878: Compiled in the office of the Board, in great part, from observations by Meteorological Observers of the Board.
19. Weekly Reports of Diseases in Michigan during the year 1878, including a Compilation of the Weekly Reports from Health Officers of Cities and from Regular Correspondents of the Board: Compiled in the office of the Board.
20. Outline or Plan for Examinations in Sanitary Science: H. F. Lyster, M. D., Committee.

Besides this work, preparation was made for the Sanitary Conventions which were held under the auspices of the Board; the first at Detroit in January last, over which, in the absence of Hon. H. P. Baldwin, its President, Dr. Wm. Brodie as first Vice President presided; the second was held at Grand Rapids in February, and was presided over by Rt. Rev. George D. Gillespie.

It is believed that both of these conventions were successful in the accomplishment of the purposes for which they were projected, viz.: to extend and increase the interest felt in the work of the Board and sanitary problems now pressing for a solution.

At these conventions the following papers were presented, which will appear in the Secretary's Report for 1880:

TITLES OF PAPERS PRESENTED AT THE SANITARY CONVENTION AT DETROIT, JANUARY 7 AND 8, 1880.

Opening Address: By Wm. Brodie, M. D., President.
Contamination of Drinking Water by Infiltration of Organic Matter through the Soil: By Victor C. Vaughan, M. D.
Supply of Milk in Cities: By G. A. Watkins.
Contagious Diseases among Cattle: By Alexander J. Murray, V. S.
Methods of Study in Sanitary Science: By John S. Caulkins, M. D.
Light in the Public Schools, and School Life in relation to Vision: By Dr. C. J. Lundy.
Limitation of Pulmonary Consumption: By H. F. Lyster, M. D.
Sanitary Rewards and Punishments: By Hon. Henry W. Lord.
Inspection of the Sewerage System of Detroit: By W. F. Craig, C. E.
Ventilation of Dwelling Houses: By Duncan McLeod, M. D.
Neurasthenia: By W. H. Rouse, M. D.
Principles of Ventilation: By Thomas A. Parker.
Remarks by John S. Billings, M. D., U. S. A.
Use of Household Filters for Potable Water: By Prof. Albert B. Prescott.
City of Destruction: By R. C. Kedzie.
Training Schools of Cookery: Mrs. W. Jenison.
Adulteration of Food: By Dr. Carl Jungk.
School Hygiene: By Prof. J. M. B. Sill.
Cosmetics: By C. C. Yemans, M. D.

AT GRAND RAPIDS, FEBRUARY 17 AND 18, 1880.

Opening Address by Rt. Rev. Geo. D. Gillespie, President.
General Sanitation,—its importance to the Public Welfare, and a plea for better methods: By Henry B. Baker, M. D.
Duties of the Christian in respect to the Laws of Health: By Rev. J. Morgan Smith.
The Sewerage of the City: By A. C. Sekell.
Prevention Better than Cure: By M. Veenboer, M. D.
Air Moistening.
Relations of the Clergy to Sanitary Reform: By Rev. J. F. Conover.
Cooking: By Mrs. S. A. Ballard.
System of Sewerage at the State Public School: By Hon. C. D. Randall.
The Health of the Young as Affected by School and School Architecture: By Prof. E. A. Strong.
Some Conditions of Combustibility: By R. C. Kedzie, M. D.

Kalamazoo, May 12, 1880.

REPORT OF THE COMMITTEE ON EX-PRESIDENT COX'S ADDRESS.

MR. PRESIDENT AND GENTLEMEN:—One year ago Dr. Cox, then President of this Association, took occasion in his address to speak of the great prevalence of criminal abortion, portraying in fitting terms its moral depravity, its physiological evils, its direct tendency to encourage licentiousness, and to some extent discussed the means by which it might be checked. The address was referred to your committee for report at this session.

In making this report, your committee beg leave to say that until the moral sense of the people, now greatly debased on this subject, can be quickened to make a higher and truer estimate of the enormity of this crime against all moral and physical laws, but little can be done to arrest the evil. The medical profession condemn it, nature herself pleads against it, and human laws forbid it; but fashion, laziness, and sordid selfishness unite to plead for it, and with far too much success. Against these latter influences the medical profession make impotent war; the terrors of law furnish no check, until the moral nature of the people has been educated to understand that, in its moral aspects, *deliberate abortion is deliberate murder.*

The difficulty in the way of abating this monstrous crime *by law* lies in the fact that, before murder or manslaughter can be established before a jury, a living human being must have been shown to have existed, and shown also to have been destroyed. By the common law, the period of quickening has been recognized as the beginning of life, because the motion of the child in the womb is the first proof of life cognizable by the senses. But by whose senses? Manifestly the mother's own senses. Hence, to establish the offense, it is necessary to prove by the mother, if living, that she felt fœtal motion before the abortion was committed; or, if she be dead or if she refuse

to testify, it is competent to prove that she admitted to some person or persons that she had felt the child's motion. By common law, this is deemed sufficient to establish the first and fundamental fact, that there was a life to take away—a living human being to kill.

If this first fact be thus established, and it be possible, then, to prove that this life was deliberately taken away,—that this living human being was killed,—the crime, as a matter of proof, is established. But will a jury convict? Even when proof is fullest and clearest, will a jury inflict the penalty of the law? Common observation and experience give us the answer in the negative. Here, even here, where the ground is solid, where it has been made plain that human life has been deliberately taken, we find that the moral sense of our people needs to be educated and quickened to a higher and truer standard before the law can be efficient to eradicate this great and growing evil.

If this be a true picture of the insufficiency of law in recognizing and punishing this crime *after* quickening, how much more do we need to cultivate a truer and higher moral sense to prevent the commission of this crime *before* quickening.

If, now, the question be asked, how can this moral sense be developed, we are naturally led to think that the church and the pulpit (the commonly recognized chief moral agencies of society) must assume the duty of moral teacher on this topic. Besides the Catholic Church, we know of none that holds correct doctrines on this subject, and that inculcates and enforces right practice as well.

The remedies for this evil under discussion seem now to be susceptible of a brief statement: 1st, fearless and correct teaching by the church and all moral agencies; 2d, sound physiological instructions by the medical profession; and 3d, wise laws efficiently executed. Laws will be efficient when the general intelligence comprehends the physical mischief done, and the general moral sense comprehends the crime committed by every abortionist.

FOSTER PRATT,
CHAS. SHEPARD,
I. E. BROWN.

THE ACTUAL CAUTERY.

BY WM. H. DE CAMP, M. D., GRAND RAPIDS.

It is well known by all members of this Society, that the actual cautery has been recorded among the early remedial agents in surgery. In looking up its early history, we find it first mentioned at a period about 500 years B. C. It dates before the time of Hippocrates, who lived about 400 years before Christ, and after Pythagoras, whose time was about 200 years previous. It was then used to arrest hæmorrhage, and for little else. Henophon of Cos, is said to have been the first to use the ligature for arresting hæmorrhage. This gives it a date so early as 2100 years since. We find no mention of any other means but the actual cautery and styptics prior to this date for this purpose.

Like many other remedies of ancient date, it has at different times been partially crowded out of use for something more new and less understood. The fashion with the medical profession is to be constantly on the lookout for every new thing that is brought before it by some aspirant for notoriety for being the first to sound the alarm, that something has been born to the medical world that shall honor their name by being called *their* remedy, or *their* operation, or *their* disease, has caused the members to always keep their eyes to the front. This has been the custom to such an extent, that nearly all members have scarcely thought of looking back upon what ancestral medicine consisted in, any more than a private soldier would think of looking behind him when on dress parade if ordered to "*front face.*"

Professor S. D. Gross,—who now stands so high in the estimation of the profession that I heard it stated at the meeting of the American Medical Congress in 1876 by a member from Europe, and assented to by many others from abroad, that he stood before the world as the greatest surgeon of the age,—has seen fit to bring to the notice of the profession, by a paper to the American Medical Association in 1875, the use of

the lancet as the "lost art in medicine." This would apparently show that things in medicine grew rapidly old in the grasping for something new; for it is within my recollection as well as that of others present, when the lancet was unsheathed and bathed in blood, in all forms of undue febrile excitement, as the great remedial agent mightier than all others to quell a fever or destroy an inflammation. This fact seems to illustrate how short a time it takes for things to become old, or for new things to supplant them.

For a patient to see a glowing iron coming directly from the fire was a thing more terrifying before the days of anæsthetics than now, and deterred many a timid one from submitting to its use where other means could be substituted.

For a remedy or agent in surgery to keep a place in the list of standard remedies for a period of 2,400 years is enough to prove its usefulness and superiority over many other things less obnoxious to the minds of those suffering from maladies demanding its use.

It is not my purpose here to state its many good qualities, or show a differential value between it and other agents, but simply to give to the Society my experience and knowledge of the different forms of the same, and the improvements of the present day in procuring an instrument well and constantly heated while in use.

Modern writers speak most highly of the electric cautery for procuring this result. This means of heating by electricity is one that can be used for some purposes better than any other. The means for generating sufficient intensity to make it efficient involves much cost and an instrument not portable. Those made for portable use are not capable of maintaining sufficient heat to make their work rapid. From an examination of most of the standard surgical authorities of the present day, I am satisfied they give the highest place to the electric cautery of any one means of commanding the heat as required in uterine surgery, and the cautery ecraseur for removal of tumors.

The form most highly spoken of is that of Middeldorpff's of Breslau. I have tried the Byrne portable battery many times, and found it required much care to keep in order, and a cost of about $80 to procure. The instrument that has given the most complete satisfaction, and the one that is practically as near perfect in its workings and supplies all the demands we can expect from any device for this purpose, is the "Cautere Paquelin," as it is made with its improvements and attachments by G. Tremoum & Co.

This instrument I will exhibit in working order.

REPORT OF THE BOARD OF EXAMINERS OF THE UNIVERSITY MEDICAL DEPARTMENT.

The undersigned, who were appointed by the Regents of the University Examiners in the Medical Department for the year 1879, having attended to our duties at the June examination made to the honorable Board of Regents, now make to this Society the following report:

For the June examination we prepared six topics on each of six subjects (copies of which were presented to the Society last year), viz.: Anatomy and Physiology, Materia Medica, Chemistry, Surgery and Surgical Anatomy, Practice of Medicine, and Obstetrics and Diseases of Women and Children.

These topics were sent to the Faculty, were presented, and during the first week in June were written upon by the candidates for graduation three topics on each of two subjects each day, by each one of the candidates in the presence of the Professors or assistants of said departments. These written papers were submitted to us, and formed the basis of our estimate of the practical intelligence on these subjects by the several candidates.

We desire to express our commendation and gratification in the great majority of these papers. Most of them showed their authors had mature and well disciplined minds. They also showed a great advance on those written by the spring graduates,—demonstrating conclusively the benefit of the increased length of term of instruction.

We were particularly interested in the papers of the female candidates, whom we considered, as a rule, had had more educational advantages before entering the class than the young men. The papers also showed that they had been well grounded and thoroughly drilled in the subjects on which they wrote.

We cannot help remarking, however, that there were several papers which did not appear to justify us in voting for

the graduation of their authors. All these papers were deficient in those directions which indicated want of mental discipline, and want of that degree of common education and mental training which should *never be wanting* in a physician.

Had it not been that your Examiners were compelled to believe that the requirements of previous education, already adopted by the Faculty in Nov. 13th, 1873, had not been enforced upon those students entering the Medical Department of the University, we should have been compelled to enter a very strong protest against their graduation. And we should be especially remiss in what we owe to the medical profession if we had not then and there recommended and strongly urged upon the controlling powers of the University that they should advertise in their next announcement the requirements for admission as adopted in 1873 (with these modifications that the applicants should have at least a sufficient knowledge of Latin and Greek to enable them to readily read the Latin and Greek readers); and we trust that a standard equal to that for the admission of candidates to the Freshman course in the Literary or Scientific departments will eventually be adopted, and then that a rigid enforcement of the standard be required of the Faculty.

We believe such a course will insure the best prosperity of the Medical Department, and we know it will meet the most earnest wishes of the great body of the medical profession, besides saving to the applicant not only his time and money, but also the disgrace of rejection in final examination.

We also take pleasure in announcing that the action of the Regents in the appointment of Medical Examiners has met the approval of the medical profession of Michigan.

WM. BRODIE,
H. O. HITCHCOCK.

ECLAMPSIA WITH URÆMIC TOXÆMIA, PROMPTLY RELIEVED BY VERATRUM VIRIDE.

BY A. F. KINNE, A. M., M. D., OF YPSILANTI.

Mrs. E. R., aged 30 years, seven and one-half months along in her first pregnancy, came under my notice March 2, 1880. She was dropsical; the swelling of the lower extremities extended quite up to the body and involved the labia, and the discomfort from this was such as to make a recumbent posture desirable. But in view of the case as it rapidly developed itself, it was remarkable that beyond the local uneasiness which she felt when on her feet there was not much of which she could complain; there had been no headache, no dimness of vision, no failure of the eyesight upon stooping, no dizziness, and she had not then noticed that the urine was scanty or high-colored. During the night, however, there came on a distinct headache, and at 12.30 the next day she had her first eclamptic spasm; and upon boiling a specimen of the urine which, in the mean time, had been handed me, it was "solid" with albumen.

At 2.30, soon after my arrival at the house, she had a second spasm, and with the advice and assistance of her father-in-law, Dr. F. K. Rexford, I bled her, say, 16 oz. At 3.15 she got ten grains of chloral hydrate, and at 4.15 the same; but this second hourly dose she rejected. At 4.45, therefore, I repeated the dose, and the same at 5.45, and both these doses she retained. These doses of the narcotic made her sleepy decidedly, but this effect, though encouraging in appearance, was deceptive, and at 6 o'clock she had a third spasm. At 6.45 gave her 10 grains chloral; at 7.15 had the fourth spasm; at 8, ten grains of chloral; and at 8.30 she had spasm No. 5.

Up to this time, not counting the dose rejected, she had taken fifty grains of chloral in about five hours; but its action had disappointed me. The spasms were recurring with an increasing frequency. The coma had become profound, and yet she was not apoplectic. She was narcotized, and the medicine and the malady were coöperating to increase the narcotism.

No sign of labor had been at any time detected, and a digital examination confirmed this observation. It was a case of eclampsia from albuminuria, or rather from uræmia; or, better still, from the deep and *extensive* kidney lesion upon which these depended.

But it is not enough to say that the urine was very highly albuminous,—I must add, also, that it was scanty, and, not "high colored" exactly, but of a reddish, almost bloody, appearance, and muddy. I was reminded of the urine which we sometimes see in bad cases of croupous nephritis after scarletina. The two secretions are nearly the same in appearance and composition; and I believe, also, that these convulsions were about the same as those we sometimes witness in that formidable affection.

In both of these maladies the blood is loaded with effete materials in consequence of the failure of the function of the kidneys; and by the circulation of an impure blood, "a high degree of impressibility and excitability, accompanied with congestion," is induced in the great nerve centres of the true spinal cord, and hence the convulsive spasms and the coma—(Tate in Obst. Gazette, April, 1880, p. 439); and the therapeutic question for me to decide, therefore, was: through what channel other than the kidneys should this blood poisoning be eliminated?

With the use of pilocarpine in eclampsia I have had no experience. I sent for some croton oil, but did not wait for its arrival, and gave instead at 8.55 three minims of the fluid extract veratrum viride by hypodermic injection.

At 9.30 occurred the sixth and last convulsion. It had come on after an interval of only forty minutes, and was very severe. At 9.30 I repeated the injection of veratrum, and the effect was sufficiently decisive. In a little time the pulse, which had risen to 120 (T. 100° F.) began to drop, and continued to fall rapidly off until it counted fifty; and the heart's action was unsteady, peculiarly so. It seemed to *stagger* (if I may use such an expression), and I began to have a little fear that the action of the veratrum would be excessive. But at 10 o'clock she vomited freely, and after that the pulse rose a lit-

tle and became steadier, varying between sixty and seventy, and continued so. And the vomiting continued also, recurring every fifteen or twenty minutes for two or three hours. The matter ejected was not bilious in color, but brownish, suggestive of an admixture of grumous blood, and it was adhesive and ropy, and copious. It was a very thorough emetic operation. Of course I might have checked it at any time, but it did not seem best. Its depurative effect seemed likely to be just what my patient needed. She bore it well at any rate, and so far as any change was apparent, seemed to rally under it. And in the sequel it was quite apparent that the uræmic toxæmia, which existed in this case to so marked a degree, was mainly eliminated by way of the stomach by the emetic action of the veratrum, and that the part left to be removed by other channels was comparatively inconsiderable.

Let us see how this conclusion was arrived at.

I had the able assistance in this case of Prof. E. S. Dunster of the University of Michigan. But when he arrived at about half-past one in the morning, the patient had had no spasms for more than four hours; the vomiting had ceased; she was fast recovering her consciousness, and in every other respect was much improved.

A careful examination confirmed my view that the child was dead; but as our patient needed rest, it was not deemed advisable to take steps towards bringing the labor on at least for the present. It was agreed that she needed a moderate action of the veratrum, combined with aconite, and a bottle of the sol. citrate of magnesia, in divided doses, until the bowels moved freely. And this was the substance of the consultation.

But before Dr. Dunster left us in the morning we got another sample of the urine,—which, it will be noticed, had been secreted during and since the emesis,—and it showed a decided improvement, a falling off in the albumen of at least one-half; but it still had a reddish-brown and muddy appearance, and in the evening I received from Dr. D. the following note:

ANN ARBOR, *March 4, 1880.*

MY DEAR DOCTOR:—I am sorry to report that the urine I brought with me contains granular casts in great abundance and large amounts of degenerated epithelium from the uriniferous tubules,—some pus corpuscles. This is bad, but by no means hopeless, for it is astonishing what serious lesions the kidneys will often recover from. It only necessitates increased care. Give her *distilled* water to drink, and let the bowels and skin do their work.

In great haste, Yours,

E. S. DUNSTER.

This advice was good, of course, but new phases of the case, with their appropriate treatment, hastening to present themselves, interfered with it; and in a short time it became evident that it was no longer required, all symptoms of the kidney lesion having disappeared as if by magic. She took the veratrum only during the day, and the operation of the physic was moderate.

Her labor came on naturally at 8.15 in the evening, and, without anything worthy of note, the child was born in about four hours. It was a boy, and of good size, but it was dead, and must have been dead, as its state of decomposition indicated, a number of days.

The next day no specimen of the urine was furnished; the nurse "could not separate it from the lochia;" and on the 6th all trace of albumen had disappeared from it, and its color and quantity were natural.

The effect of the blood poisoning upon the patient herself, however, was by no means transient. She was not exsanguined, for the loss of blood during the delivery had been inconsiderable, but she was very weak; and the action of the heart was feeble and dicrotous, such as we find in the advanced stages of some exhausting fevers. Instead of the two normal impulses, three were heard, which could be well enough described by the syllables *both-er-it*, while as felt at the wrist there were two pulses, the second a little weaker than the first, and counting 140, or 70 each, per minute.

This stage of extreme prostration lasted about a week. I give the tinct. digitalis, tinct. ferri chlor., distilled water to drink, and made the diet as nutritious as possible; and with this treatment she went on to make a good recovery.

I am aware that this case, objectively regarded at least, presents no very novel features; but there is a pathological point here which, in its therapeutical relations at least, has not received the attention which it deserves. And it is briefly this:

In the treatment of these cases we should endeavor to find out, if we can, not what is the *depth* of the kidney lesion, but what is its extent; in other words, whether the case is complicated with any great amount of blood poisoning or not; and this very dangerous element will be found wanting except in a very small minority of our cases. Eclamptic convulsions, and comatose symptoms and albuminuria, do not certainly indicate any great amount of blood poisoning of course; and if the urine be examined microscopically, we may find the granular casts and the degenerated epithelium,—all the evidences

of an intense lesion of the kidneys; and every one of these features of the case may be intensified to a very dangerous degree,—to a fatal degree even. And yet, after all, we may not have the very worst possible kind of case, for the simple reason that only one of the kidneys is affected, or at least some portion of the kidney substance is still in condition to carry out of the system the products of tissue metamorphosis, and no great amount of blood-poisoning is therefore present. And, moreover, we shall probably find this kind of case quite amenable to treatment. A vigorous, old-fashioned blood-letting may be all that is required; or, if need be, chloroform or any other narcotic can be resorted to with good results.

And, still further, if we inquire into the condition of the child, we shall find, whether it is already born or not, that the nervous disturbances of the mother have not materially injured it.

But in the case which I have reported, these favorable conditions of the mother and child did not exist. The child, which seems to be the first to suffer, had already been dead several days; and in the case of the mother, the failure of ordinary remedies to control the convulsions and her excessive subsequent prostration, were conspicuous. And as to the treatment, I may add that without the veratrum viride, I do not know, in such cases as this, what adequate remedy we have. And it need not be understood that the use of the veratrum in eclampsia is confined to the cases where blood poisoning is present, and I have sometimes given it combined with morphine, in which combination the dose should be considerably increased. Emesis has resulted in every instance, and in some cases diaphoresis and diuresis also. But its emetic action, as being most essential, is that to which I have sought to call the attention of the Society.

HERPES.

BY C. C. YEMANS, M. D., PROFESSOR OF DERMOTOLOGY, MICHIGAN COLLEGE OF MEDICINE.

With limited faculties, and compelled to observe phenomena in infinite variety, and because we can consider but few units, from four to six at one time, without confusion, the process of generalization is our highest mental act. Witness in Philosophy, Kant, Spinoza, Bacon, Des Cartes; in Mathematics, Galleo, Des Cartes, Pascal, Newton; in Theology, Martinon, Chalmers; in general science, Humboldt, Tyndall; in Botany, Linnæus, Jussien. Indeed, advances are made by those who generalize. We then classify and render our knowledge clear and permanent. In a particular department of investigation quite limited,—as Dermatology, for example,—to classify well is to place a specialty in position to demand attention and respect.

As we have passed from the complicated, though useful, "sexual" or artificial classification of Linnæus to the simpler and "natural classification" of Jussien and his school, and rendered the study of Botany a pleasant recreation, and at the same time the most rigorous of the natural sciences, so we are beyond the nomenclature of even Hebra and Neuman, and have come to the clearer, more natural arrangement of modern American Dermatologists.

The older classifications are monuments of industry and patient observation, genius and skill, but a more accurate knowledge of Pathology and Histology has compelled revision.

I wish to call your attention to the classification of the American Dermatological Association, which I here produce but slightly modified:

Class I. Morbi cutis parasitici—Parisitic Affections.
" II. Morbi glandularum cutis—Glandular Affections.
" III. Neuroses—Neurotic Affections.
" IV. Hyperæmiæ—Hyperæmic Affections.
" V. Exsudationes—Exudative or Inflam. Affections.
" VI. Hæmorrhagiæ—Hemorrhagic Affections.
" VII. Hypertrophiæ—Hyperthrophic Affections.
" VIII. Atropiæ—Atropic Affections.
" IX. Neoplasmata—New Formations.

Any attempt, therefore, to so classify skin diseases, based upon the requisite knowledge, in such a manner as to give clearness to the subject, deserves, not derision, but praise.

One weak point, aside from manifest errors, in Willian, for instance, was the confusion arising from *stages* in any certain disease, as Eczema for example,—which may pass through the papular, vesicular, and squamous stages before becoming catarrhal.

In no special case is this (the error) more apparent than in Herpes.

"Herpes," a term old enough to have been used by Hippocrates, has been applied in time past to numerous and varied affections. Even at the present time there are those who apply it, with varying adjectives to both vesicular and bullous, as well as parasitic affections.

The word "Herpes" is now used within exceedingly narrow limits, designating only "an acute inflammatory affection, consisting of one or more groups of vesicles occurring on the face or external genitals," to wit: Herpes Facialis, Herpes Progenitalis.

We then have, before covered by the term Herpes, Zoster, Hydroa, and Pemphligus. I shall use the term Herpes with its more limited and, I think, proper signification.

"The Etiology of Herpes is not thoroughly understood, but it is supposed to be due to reflex nervous irritation." Herpes is symptomatic of a neurosis dependent upon some general dyscrasia or local irritation. In rigorous language, then Herpes is a *sequence* of nervous irritation, and is not for the consideration of the dermatologist only, but for the neurologist as well.

Herpes is, strictly speaking, limited to the face, including the eyes,—Herpes Corneæ being admissible, and to the prepuce. Herpes Zoster is not admissible, and must give place to Zoster, dropping the substantive Herpes, Zoster being a distinct lesion, separated from Herpes by well marked physical differences as well as pathological conditions.

Herpes Facialis may invade the fauces, nares, or pharynx, and in such case demands carefulness in diagnosis. Herpes of pharynx or nares is frequently the cause of acute catarrh.

I do not come to teach you to recognize Herpes, for with its characteristics you are long since familiar, but I present this paper for the double reason of defining the limits of the word as now used by dermatologists of our own country, and to give an opinion upon the treatment of this common affection.

A word as to allied affections Zoster, Hydoa, Pemphligus. Zoster differs from Herpes in this: it is more painful and vesicular eruption is not synchronous. Hydoa is the old herpetic eruption of the extremities, and the vesicles are distinct, while Herpes is in groups and simultaneous. Let it not be forgotten that Zoster may invade the intestinal tract and cause troublesome, painful, and, if not recognized, fatal diarrhea. Herpes and Zoster may require the same treatment, both local and general. Indeed, Herpes Facialis needs but little attention; it often follows tri-facial neuralgia, the coming of the eruption working the subsidence of the pain; while Herpes, which is the result of nervous irritation from some general cause, as malaria (including Zoster), requires both general and topical treatment.

Of the general treatment of nervous irritation which has caused the vesicular explosion, I need not write for general practitioners. The exhibition of antiperiodics, tonics, good food, possibly a cathartic, will fill the indications, and bring about prompt recovery, except in some cases of Zoster.

I am not aware of any particular case which illustrates the value of correct pathological knowledge better than this of Herpes, which formerly was classed with vesicular eruptions, a pure skin lesion, and treated accordingly.

LOCAL TREATMENT.

The local treatment of Herpes and Zoster is quite simple. Keep the parts clean and dry. Ointments usually irritate, frequently cause great pain, sometimes amounting to agony. Covering the eruption with cosmoline, so as to exclude all air, sometimes relieves. The better rule is, however, never use ointments, more especially cerate ointments. Cover the eruption with dry calomel, corn-starch, or roasted flour.

There are three cases requiring special notice:

1st. Herpes Cornæ.—This is a common form, and requires prompt attention. No irritating wash will be helpful. Treatment as above,—dry calomel gently dusted over the globe.

2d. Herpes of mucus surface, as, for example, the septum

narium; as in the eye the parts are macerated more or less, and the diagnosis is so rendered more difficult. Here dry calomel will do, but I have good success with equal parts of iodiform and tannin. Sometimes when the catarrhal secretion is abundant, I cover the parts after dusting with cosmoline, with good results.

3d. Herpes Preputialis.—The differential diagnosis from venereal trouble is sometimes difficult, and an error may be serious in its results. I assume you to be familiar with the points in making differential diagnosis. I use here either dry calomel or iodiform and tannin, equal parts, dusted over the ulcerated surface. The latter with me has become quite a favorite.

I thank you for the opportunity to read a paper which does not aim to be exhaustive, but rather suggestive.

A CASE OF COMPOUND DISLOCATION OF THE ASTRAGALUS.

REPORTED BY JOHN BRADY, M. D., OF GRAND RAPIDS, MICH.

MR. PRESIDENT AND GENTLEMEN:—I report this case not because the treatment of it has been a triumph for surgery, or a splendid exemplification of the value of some vaunted new remedy; my object is simply to put it on record that others may profit by the information to be derived from it, for I believe the report of an unsuccessful case may often be as profitable as the report of a successful one, if it point out the causes of failure so that they may be avoided on future occasions. A compound dislocation is generally and very properly regarded as one of the most dangerous accidents that can happen to a limb. Of this fact had any doubts been entertained, the result of the case I am about to report would suffice to dispel them.

A young man, aet. 27, of sound constitution, good health, and temperate habits; for a living pursued active outside labor, working on farms in summer, in winter in the pine woods. His occupation had its usual effect on constitution and general health, and wounds on his person healed with unusual facility. I remember on one occasion, while making kindling-wood with a draw-knife, he cut his leg and lifted clear off the joint the patella of the right knee; he replaced it immediately, and the wound healed promptly, the joint escaping the usual consequences of the injury.

On the 29th of April, 1879, while engaged breaking a roleway, a log rolled on to the lower part of the thigh, producing a compound dislocation of the right astragalus. As near as I could learn, at the time of the accident the knee was in a

flexed position, the foot being a fixed point of resistance, and so firmly held it could not recede from the weight thrown on to it. His companions suspecting the ankle badly sprained or thrown out of place, proceeded, without removing the boot, to pull the foot into its natural shape again; they then put him on horseback, and he rode four miles to reach his quarters, and sent for a surgeon, under whose diligent attention he remained in camp three weeks. He was then transferred by rail, a day's journey, to Grand Rapids, and placed in my care, in a comfortable family residence where he had well cooked, wholesome food and good nursing.

The surgeon who had charge, still hopeful the foot could be saved, and feeling a deep interest in the case, kindly furnished me by letter the following history, viz.:

"F. L. was struck, April 29, by a log just above the knee, producing a compound dislocation of the astragalus; the head of the bone was driven forwards and inwards, the two facets being quite plainly visible. Dr. V. arrived the following day. We then removed the bone and sewed up the wound. At the Doctor's request, I put foot and leg in plaster of Paris two days after the operation, leaving an aperture opposite the wound. I allowed the plaster to remain on about a week, and only took it off when I found pus escaping from the outside of the foot. Individually I was in favor of a box from the first as giving a better opportunity of examining the whole of the foot, and also regulating the amount of pressure the foot could bear; for that reason I put it up as you now find it."

On arrival the limb was found resting on nicely-stuffed cushions in a fracture box; the sores about the leg and ankle dressed with oakum and carbolized oil. The patient was hopeful, but somewhat fatigued and disturbed by his journey. Two abscesses occupied the foot,—one on the dorsum, the other beneath the deep plantar facia. Three sores, the largest of which, about three inches in diameter, irregular in outline and full of granular tissue, were situated in front of and directly over the internal maleolus; the other two were on the outside of the leg immediately over the fibula,—they were about four inches apart; one of them led down to the maleolus, the other to the shaft, and both were connected by a deep sinus. The lower end of the fibula was partly necrosed, the maleolus completely, and exposed to view. Deep sinuses passed in front of and behind the ankle, from the inside to the outside of the foot, and from these points to the abscess on the upper part of the foot. There was a constant and

copious discharge of grumous ill-conditioned pus from all the channels described.

The end of the tibia was stripped of cartilage, rough and honey-combed. Caries had made progress in the os calcis, scaphoid, and cuboid. The general condition of the patient might be inferred from what has been already stated,—it was in keeping with the state of the limb. A high degree of constitutional irritation marked the progress of disease amongst the bones, and was attended with hectic, subsultus, free perspiration, and sudamina.

The patient being now at least under favorable hygienic conditions, no attention was omitted to bring the limb into a favorable condition for repair. Pus was evacuated from every point accessible, and all the sinuses washed out twice a day and treated with nitric acid, Labarraque's solution, and carbolized oil. Drainage tubes were placed in every channel where they were likely to be of advantage.

At the end of a week there was no appreciable improvement, —in fact, the state of the bones of the tarsus and metatarsus made it evident that further attempts to save the limb would result in failure and death.

To the last recourse we had to offer in order to safe life the patient submitted. Accordingly, four weeks from the date of injury amputation by the circular method was performed, after which his life hung in the balance four days. He, however, made a good recovery in three weeks, with a well formed useful stump.

After a storm comes a calm, a most auspicious occasion to repair the damage done by the elements, and to set affairs in their right course again. The trials incident to this case being finished, and the patient enjoying the repose of mind which belongs to recovery, it may not be amiss to review the practice pursued to save his foot, and the circumstances that made it necessary to amputate. The attempts made by the surgeon to save the limb were, to say the least, commendable, and failure must be ascribed to other causes than neglect of removing the astragalus, because the excision of the astragalus was a necessary proceeding under the circumstances, and accomplished two important indications in treatment. To a certain extent it removed the irritation incident to a foreign body in the joint; and by shortening the limb an inch or more placed the strictures and injured muscles in a favorable state of repose,—an indication particularly emphasized by Hamilton. Besides, "of eighteen cases of complete excision collected by Turner, fourteen made good recoveries, and in

only one of these fourteen was there anchylosis." So far, then, as excision was concerned, the proceeding was in accordance with common sense principles, and also in conformity with the teaching of reliable authority, and therefore the practice was very proper.

Can as much be said in favor of the next step in the treatments,—the application of the plaster bandage? It is doubtful, when we remember the immediate consequences of the injury and the source whence danger is likely to spring. According to Sir Astley Cooper, "the danger consists in the rapid inflammation of the synovial membrane, which is speedily followed by suppuration and ulceration, whereby the ends of the bones become exposed; and for the repair of which lesions, great general, as well as local efforts are required, and a high degree of constitutional irritation results." If we accept herein the views of Sir Astley, any application that would occlude the limb from frequent inspection and the unremitting use of appropriate antiphlogistic remedies would be likely to result in harm. Plaster bandage has many points of practical utility, and no doubt in the treatment of fractures makes an excellent support to the limb; but I should look with distrust on its immediate application after excision, when from the nature of the injury active inflammation and great swelling of the parts are certain to supervene.

Resection we consider the best practice in most of these unfortunate accidents; but what it was possible for it to have accomplished in this case we cannot now determine; neither can we regret that it was not performed immediately, for in the beginnning there was reason to believe the more simple proceeding of excising the astragalus would have accomplished the object in view. At a later period the question of resection was excluded by the condition of the bones of the foot, and no resource left to save life but amputation.

The foregoing circumstances and facts tend to show the grave consequences that follow these serious accidents, and how powerless *is* the surgeon to thwart or avert them. If further testimony were required we might cite case after case of our own and of other surgeons; but one, perhaps, will suffice. It is taken from F. H. Hamilton's last edition on Fractures and Dislocations:

"Rosanna Wilbur, aet. 45, was admitted to Bellevue, Jan. 1st, 1875, having just been injured by a street car. She was in good health, but very fat, weighing 185 pounds. She was found to have a compound dislocation of the right ankle joint, the tibia being thrust completely through the flesh, and also a

fracture of the fibula. Dr. Lewis, the house surgeon, reduced the dislocation at once, and easily, and then sent for Dr. H. He advised an attempt to save the limb without resection, and by supporting the limb with plaster Paris dressing; this dressing was applied fourteen hours after the accident by Dr. Lewis, a window being made opposite the ankle. January 3d the window was enlarged. January 5th, gangrene and phlebitis had occurred; fenestra again enlarged. January 7th, entire splint laid open and hot water dressings applied. January 12th, suspended limb. January 21, the condition of the limb very critical, and in a consultation composed of the visiting surgeons, they were equally divided between amputation and resection. It was permitted, therefore, that Hamilton should choose his own course. He immediately resected two inches of the lower end of the tibia and placed the limb again in a sling, supported with compresses as a means of lateral support, and warm water dressings were continued. The subsequent progress of the case was very slow, and there were several smart attacks of erysipelas, so that her life was at times in danger; but finally all unfavorable symptoms disappeared, and on the first of May the ankle was in perfect shape, admitting of some flexion and extension, and the wounds were almost completely closed."

The inference which Prof. Hamilton comes to is as follows, viz.: "It is now apparent that a resection on the first day would have been the most judicious practice, but that even at a later day it saved her life."

This is not the only conclusion Prof. Hamilton might have drawn from his case, for it is susceptible of other construction. Without straining his judgment in the least, he could have told us what produced the gangrene and the phlebitis. But it was scarcely necessary, the cause being so evident. And so it happened in the case I am about to submit. Hence, I conclude, taking all the facts and circumstances into consideration, the result is not extraordinary, for the reports of compound dislocations, while they present conclusive evidence in favor of resection, furnish occasionally the history of a patient submitted to amputation after other resources had been tried in vain.

MEDICAL SUPERSTITIONS.

BY E. B. WARD, M. D., LAINGSBURGH.

Since the first organization of this medical society in '66, I have been a quiet member thereof, and you will all bear me witness that I have never bored you with any preconceived notions of my own, brought forth in lengthy platitudes and accouchered by the aid of a long-lingering eternity of time that suggested instrumental interference.

I say I have never perpetrated upon you any such torture, but upon this occasion I feel it my duty to call your several attentions to the subject of this article; and if you will take notice and allow the ideas herein contained to gently enter that portion of your systems supposed to be the seat of thought, you may possibly hear something that will at least have the fleeting charm of novelty, and sleep better nights in the consciousness that you are nearer heaven, and know more than you did yesterday.

The subject of this article is "Susperstitions in Medicine;" and if in my lofty skips of oratory I should leave you behind, by simply catching on to the train of thought you will keep along with me without the aid of steam. I will further say, that this article is a plagiarism or a compilation of thought gotten up by wiser heads than mine, and as I don't want to steal their thunder, I simply mention it so that you will know how it is yourselves, and they won't feel bad about it either.

Southey said that "man was a dupeable animal," and that is so true that we can all believe it on a week day even. Human credulity has been the mine of wealth wherein empirics have delved for ages past and will for years to come; and while the regular physician, sensitive of the deficiencies and uncertainty

of remedies, is retiring in his declarations, the unblushing quack by his bold asseverations assures the patient and assists the cure.

Few people possess either the leisure or inclination to inquire into the merits of medical men, and the bombastic charlatan captures them with an ease unknown to physicians of finer sensibilities.

In searching the history of medicine we find that chemistry is an outcome of ancient alchemy, from whence it derives its name, and which was first used at a very early period in efforts to manufacture gold from the baser metals. The Egyptians have the credit of first using chemistry in the manufacture of glass and linen and dyeing, as well as in their embalmings, wherein they exhibited a degree of art unknown to the present generation. That, however, is a matter of indifference, as upon careful thought no one person has occurred to me that was worthy of embalming.

The object of the alchemists was to convert other metals into gold and silver, to remedy all diseases, and to prolong human life indefinitely.

The importance of chemical investigations and processes as applicable to medicine was first known to Paracelsus, but a desire of transmuting baser metals into gold seems to have been at this early age the principal idea, and a love of riches was frequently the main object in the study of chemistry. Paracelsus flourished during the twelfth century, and after him Arnoldas de Villa Nova, who associated astrological acumen with alchemy, and to whom we are said to be indebted for the discovery of sulphuric, muriatic, and nitric acids, as well as the essential oil of turpentine. He also predicted the destruction of the world in 1335, but evidently made an erroneous prognosis on that occasion.

The stars and eclipses of the sun and moon were supposed to have great influence over disease. A conjunction of many stars predicted contagion, and comets denoted putrefaction, and seeds were sown, hair cut, plants gathered, and new garments put on, in certain periods of the moon. This fallacy continues measurably to this day.

Fabian Withers, speaking of physicians, says: "So far are they distant from the true knowledge of physic who are ignorant of astrology, that they ought not rightly to be called physicians, but deceivers."

In savage nations the doctors are all conjurers and wizards, supposed to be gifted with divine or demoniacal natures; and even in civilized countries we find an occasional demonstration

of the latter. This, of course, has no reference to any member of this Society.

Bacon once said that "Witches and impostors have always held a competition with physicians," and they probably always will, for the gullibility of the human family is just as great to-day as it was when the prophets of Baal tried to call down fire to light their altar, and which, I may say in parenthesis, was successfully performed by the opposing counsel in the case.

When we come to priority in the practice of medicine, we find that Adam was the first physician as well as accoucheur.

Cain performed an unfortunate surgical operation upon his brother, but Tubal Cain, who was the first known cunning artificer in metals, has the reputation of being the first surgical instrument maker. He probably charged just as they do now,—four prices and 20 per cent off for cash. I fancy his card read something like this:

TUBAL CAIN,

Manufacturer and Dealer in

SURGICAL INSTRUMENTS, TRUSSES, SUPPORTERS, ETC.

Corner of Olive and Zion Street, Jerusalem.

Having completed his work on the Temple, the undersigned will devote his entire attention to the manufacture of Surgical Instruments. None but the best Damascus steel used in knives, and all work warranted.

Twenty per cent discount on everything.

It would seem, however, that surgery in those early days, say about five or six thousand years ago, was somewhat crude, since among all the implements found in the tombs of Egypt no instrument that can fairly be denominated surgical has hitherto been discovered.

The idea may not have occurred to you, but if you will reflect a moment you will find that the first surgical operation upon record, or at least the first successful operation, was circumcision. A knowledge of anatomy was necessary for anything more elaborate, and until that was reached surgery was comparatively dormant.

Herodotus informs us that in those good old times the practice was divided, so that there was a doctor for every variety of disorder, and that the sons followed the profession of their fathers. There must, according to that, have been almost as many doctors in those days as there is now in Michigan in proportion to the population.

As the healing art was supposed to come from divine influ-

ence, it was very natural that the priests should try to mitigate divine wrath, which was supposed to be the cause of all disease. Appeals to the oracles, divination, and magic consequently became connected with medicine.

Hippocrates was the first physician to relieve medicine from the trammels of superstition and the delusion of philosophy. The old gentleman, however, had a deal of trouble in shaking off the religious element, for if disease was of celestial origin it must require divine interposition for its removal!

The ancient Egyptians had the body divided into various portions, each of which was supposed to be under the control of a certain deity; hence we get the disemboweled man figured in our almanacs with the signs of the zodiac.

Southey wrote in the sixteenth century relative to this representative man thus:

"There Homo stands, naked but not ashamed, upon the two Pisces, one foot upon each; Aries has alighted with two feet on Homo's Head, and has sent a shaft through his forehead into his brain. Taurus has quietly seated himself across his neck. The Gemini are riding astride a little below his right shoulder. The whole trunk is laid open, as if part of the old accursed punishment for high treason had been performed upon him. The Lion occupies the thorax as his proper domain; and the Crab is in possession of the abdomen. Sagitarius has just let fly an arrow, which is on its way to his right arm. Capricornus breathes out a visible influence which penetrates both knees. Aquarius inflicts similar punctures upon both legs. Virgo fishes, as it were, at his intestines; Libra at the part affected by schoolmasters in their anger; and Scorpio takes the wickedest aim of all."

The priest-craft, however, puzzled the doctors, for when the monks found that they could no longer confine the practice of medicine to themselves, they denounced it. In 1215 Pope Innocent III. fulminated an anathema specially directed against surgery; but, finally, a special bull from the Pope effectually divorced medicine from theology. Still, in many Catholic countries the saints have proved sad enemies to the doctors.

A talisman was a favorite in those days as a preventive of disease, and was composed of any cabalistic characters, or anything supposed to possess preventive power. That idea has n't died out yet, for you have all seen men carry a horse-chestnut around to keep off rheumatism.

According to Pliny, amulets were common among the Greeks, and were worn suspended from the neck, and for

similar purposes as the talisman. They were composed of shells, gems, coral or pearl. Odd numbers have always been regarded as of serious import. Every one knows that the seventh son of a seventh son is an infallible doctor, and he don't require to know very much either, sometimes.

Charms were and are now worn for the same purposes as amulets, and there is scarcely a disease for which a charm has not been given.

Coral is a substance which was generally considered to possess power of keeping off evil spirits. Paracelsus recommends it as a remedy to be worn around the necks of children to prevent fits and turbulent dreams.

The Druids were fond of charms and incantations as curative of disease, and old clothes, pins, rags, and needles were frequently employed by them as charms. These charms are prevalent in the east as well as in Europe and England. In Grand Cairo, pieces of garments that have touched the pilgrim camel who annually carries a present to the Grand Signior, are preserved with great veneration. A hangman's halter was supposed to be very efficacious in removing disease; and even as late as 1681, Elias Ashmole in his diary says: "I took early in the morning a good dose of elixir and hung three spiders about my neck, and drove my ague away." Spiders' web is even now used as a remedy in this disease.

Passing from charms and amulets, we naturally come to the effect of mind upon the body. Whatever effect these nostrums had was due, of course, to their mental influence; and right here let me say that this is a power which, in the hands of a skillful physician, is simply immense. Medical observers constantly meet with extraordinary changes produced upon the body from passions of the mind. Jaundice has been known to appear almost instantly upon a violent fit of anger, and the hair be whitened within an hour by deadly fear. Physicians pay too little attention to this well known fact, and many times fail on account of it in the removal of disease. Some of the passions excite while others depress. Grief has been styled a "heavy executioner," and Shakespeare makes Macbeth say:

> "Canst thou not minister to a mind diseased,
> Pluck from the memory a rooted sorrow,
> Raze out the written troubles of the brain,
> And with some sweet oblivious antidote
> Cleanse the stuff'd bosom of that perilous stuff
> Which weighs upon the heart?"

Sudden mental surprises of terror, grief, or even joy, have

been known to destroy life. In fact, excessive joy has occasioned death more frequently than either grief or terror. Sophocles at an advanced age, and in full possession of his intellectual faculties, composed a tragedy, which was crowned with such success that he died through joy.

St. Bernard describes anger, joy, fear, and grief, as the four wheels of a coach by which we are carried in this world of ours. Sir Astley Cooper, in his various lectures on surgery, has noted instance after instance of death from simple terrorism, and this tendency in some patients, as you are aware, destroys the best efforts of the physician.

Of course you all know about the fabulous "royal gift of healing" which prevailed in France and England about the sixteenth century, and for a period of seven hundred years the practice of the royal touch was exercised to a greater or less degree in the cure of disease.

This subject might be elaborated, and we might linger on sympathetic disease, and the dry and wet cure; but as it was not my original intention to clear the hall, I shall abstain from further worry.

Finally, brethren, let me advise you not to lose your cud, but ruminate and reflect upon the advances you have made since the days of Anthony and Cleopatra, and upon the uncertainty which frequently attends your best efforts both in curing the patient and in getting your pay for it. Keep on in the great and somewhat glorious calling which you have adopted,—of getting up nights, and going on foot, if need be, and out of your way in the rain, to see patients who will cuss and discuss your merits, and compare your varied ability with your charlatanic, not to say satanic, competitor.

I say, keep on. Let your motto be "Excelsior," whatever that word may imply,—

And when you die,
  As die you must,
And render up
  Your earthly trust,
You'll reach a place
  Devoid of ills,
And cease to be
  A man of pills.

HEAT OR THERMIC FORCE.

ADDRESS BY G. K. JOHNSON, M. D., PRESIDENT OF THE MICHIGAN STATE MEDICAL SOCIETY.

GENTLEMEN:—My first thought and my first duty are to acknowledge my indebtedness to you. When, at the last session, your suffrage advanced me to the presidency of this Society, I was not present to tender my thanks, and to express my appreciation of the honorable distinction which your action conferred. Let me now say that I keenly realize, that as this position is one of honor, it is also one the duties and responsibilities of which require abilities to which I can lay no claim. I must, therefore, in the discharge of these duties, ask your indulgence and generous support.

It is very gratifying, gentlemen, to note the continued growth and prosperity of this Society. Its founders and promoters may feel a laudable pride in the steady increase of its membership and in the extension of its influence. It has brought together and organized the profession of the State; it gathers in at our annual conferences the best experience and the ripest thought of its members, and in various ways it stimulates scientific effort and honorable ambition. Some of its early and constant friends are still with us, honored and useful members. A few have vanished from these scenes, and gone from cares and activities which are still ours, leaving after them, be it our pleasure and duty to record, honored names and examples of useful and unblemished lives.

With respect to the work of this society I beg to make a single suggestion. I am convinced that our annual meetings could, with decided advantage, be extended to three days. I believe experience has shown that our present term of two

days is insufficient and unsatisfactory. A considerable part of both days is necessarily taken up with merely business details. It invariably happens as the result of this and of our limited time, that some papers prepared for the occasion are not read. This involves disappointment and discouragement to the authors, and deprives the Society of the benefit of hearing them. For the same reason discussions, which might be of so much interest and profit, are sometimes meager and unsatisfactory. If our sessions were extended to three days, members would go to them prepared to remain longer than they now do, authors of papers would have a hearing, discussions would be fuller and more instructive, more professional and scientific work would be done, and our transactions would grow in volume and in interest.

The occasion justifies me in referring in terms of congratulation to one conspicuous fact of the time. Never before has the medical mind been so active and so alert as at present. Unwonted zeal and hopefulness pervade the profession, and the sciences which collectively make up the noble science of medicine are being cultivated and advanced with an energy and success which have no parallel in the past. Medical literature, too, has taken on new life, and it now joins with vigor in the forward movement. The medical press teems with publications. Books and journals appear in almost bewildering rapidity and profusion, and lay before us the facts and thoughts garnered from every part of the wide and expanding fields of medicine. Physical or natural science is, in all its departments, making great and steady gains. Indeed, the successful cultivation of natural science and the application of its discoveries and principles to the affairs of life signalize the age; and medicine, as a part or segment of physical science, feels,—perhaps I ought rather to say leads,—the advance movement. The greatly improved methods of investigation, the rejection of speculation and hypotheses and the substitution of actual facts, derived from observation and experiments, as the material of science; and, not less important, the instruments of precision with which investigations are now conducted,—all these things facilitate scientific work and give greater certitude to its results. As a consequence there is, at this hour, with all well informed physicians a sentiment of high hope and of confident expectation as to the future,—an eager looking for truths and discoveries which lie not far before us. Even at this moment those who stand on the outposts of science are bending forward to catch the first gleams of the coming light.

The Forces of Nature are subjects which modern research has greatly elucidated, and the views concerning which it has revolutionized and enlarged. Heat or Thermic Force, whether viewed in connection with general physics, with chemistry, or with biology, asserts itself as the chief, the ever-present and the all-creative force of the universe. To a brief consideration of this force I propose to devote a part of the hour allotted me. In doing so I must of necessity refer to the other forces of nature, since the Creative Hand has linked them indissolubly together.

Dr. John Hunter, whose name is a light in the annals of medicine, earnestly recommended a thorough inquiry into the laws of heat in connection with the operations of nature. More than one hundred years ago he said: "Heat must be regarded as one of the first principles of action in nature; it unlocks matter, and allows it to act according to its natural properties, and it is congenial with the vital principle, which owes its vigor to a due supply of it." This brief quotation shows that John Hunter was deeply impressed with the importance of a knowledge of this agent, and that, considering the state of science in his day, he had a marvellously clear perception of its great functions in the scheme of creation.

Lord Bacon said: "Whoever undertakes to investigate the first principles of science should know the opinions of the ancients concerning the foundations of nature." There is doubtless advantage in an acquaintance with the thoughts of preceding generations touching matters of natural knowledge. The understanding is thus enlarged; greater clearness and depth of view are attained, and we are guarded against the revival, in modern guise, of errors and fancies long since exploded.

The people of the earliest ages were more profoundly impressed by fire and the sun, by the various phenomena of heat, than by any other natural objects or agencies whatever. They were awe-struck by the phenomena of fire, and they worshipped it. Flame, mysterious flame, potent alike in destruction and beneficence, seemed to them the spirit or the symbol of the divinity. The sun, as it rolled through the heavens, scattering warmth and life over the earth, filled them with reverence and wonder; and they deified it. They greeted the rising orb with hymns and acclamations, as the fountain of all life and the source of all joy. Thus sun-worship and fire-worship became the religion of all the primitive peoples of whom we have knowledge. The solar luminary was regarded as the mover of all phenomena, and, indeed, as the creativ

and formative god. Heat and life were thought to be, in some inscrutable way, identical, and were hence expressed by the same etymons and the same symbols. These references may serve to show how deeply the minds of the early and untutored races were impressed by the thermic agencies of nature, and how intuitively they connected them with physical and vital operations.

But in course of time philosophy began to busy itself with nature and its phenomena. The ancient philosophy, however, though sometimes exceedingly subtile and brilliant, was always fanciful and speculative. It did not seek truth in the facts of nature, but rather undertook, by ingenious conjectures, to determine it. As it did not rest on a careful study and analysis of the facts of nature, it did not endure. Some of its conceptions, however, were deep and sagacious, and went marvellously near to the truth as disclosed by modern science. Indeed, some of its conceptions were the germs of modern science. The atomic theory of matter, for example, now founded as an axiom of physical science, was taught by the Greek philosophers more than twenty-three centuries ago. So, too, they taught the doctrine of the indestructibility of matter; but they did not establish it by experimental proof, for they knew nothing of the means or method of doing this. Hence it was forgotten and neglected until recent times.

Thales, founder of the ancient philosophy, believed in an omnipresent, fiery ether as the efficient cause of all action in the universe, and as the self-moving power by which the elements are reduced to order and control. He further taught that this fiery ether is the proximate cause of all life both in plants and in animals. Heraclitus, twenty-five centuries ago, said: "Heat is the all-vivifying, all-transforming element. It seems to combine in itself the properties of matter and of force." Hippocrates, the illustrious physician of Cos, whose genius has descended as a radiance through so many ages, wrote that "elemental fire (or heat) is the cause of motion throughout the universe; that when united with organized bodies it constitutes the animating principle, and that it resides in all matter, producing an endless variety of effects according to fixed and definite laws." He further maintained that the science of medicine should be grounded on a comprehensive knowledge of the mode in which this principle or agent governs the operations of nature.

From the brilliant era of philosophic speculation just adverted to down to very recent times, but little progress was made in those branches of physical science which most directly bear

on the problems which the physician needs to solve. During a long lapse of time the narrow doctrine of the four elements prevailed, without challenge or question. Earth, air, fire, and water, severally and in various combination, were thought to make up the grand tableau of creation.

Stahl, a learned physician and chemist, perceiving the vast scientific importance of heat, and the crudeness and utter insufficiency of the ideas then current, developed, about 1700, his celebrated theory of phlogiston. This assumed the existence in nature of a subtle principle or matter of fire, which he called phlogiston. Phlogiston, according to the theory, is always present and fixed in all combustible bodies. Incombustible bodies do not contain it. Combustion or burning is merely the separation or escape of phlogiston from the body with which it is united. In the terse formula of this theory "the phenomenon of fire is the powerful disengagement of phlogiston." When wood, coal, or other substance is burned, the ash or residuum is the combustible body, minus the phlogiston. But let this suffice to indicate the character of the theory referred to. It was specious, seemed to explain the more common thermic phenomena, and for a considerable time was in full credit. Many theories, though radically unsound, serve some useful purpose. So it was with this. It scattered some errors previously current, and especially some of the fictions of alchemy; and it gave new impulse and better direction to chemical study and research. In all ages the prevailing theories in philosophy and chemical science have influenced medical doctrine and tinctured medical thought. So in this instance, views of disease and views of practice received impression from the current theory. There were phlogistic diseases, that is, diseases in which phlogiston was in excess, and which required, so the logical formula ran, anti-phlogistic remedies. But the theory of phlogiston, being narrow and superficial, in conflict with facts gained from observation, and utterly failing to harmonize with the general thermic operations of nature, at length fell into discredit. It gave place to another, the caloric theory of Lavoisier. That chemical philosopher demonstrated, about 1775, the real nature of combustion; explained the imperial office of oxygen in that process, and thus left the phlogistic doctrine without prop or support. He held that an imponderable substance, or a subtile igneous fluid, which he called culoric, is the principle of heat. This caloric pervades all creation, an fills the atomic interspaces of all matter. When the volume of compressible bodies is lessened by pressure, this interstitial

heat is forced out and becomes sensible; and when, on the other hand, the volume of bodies increases, as when water expands into vapor, caloric is taken up or absorbed and becomes insensible.

This theory held sway in the scientific world from the time of Lavoisier until a very recent period, and was made to explain, as best it could, the thermic phenomena of nature and of art. But advancing knowledge, the scrutinizing spirit of modern enquiry, and the more severe and exact tests of modern science, first cast doubts upon it and then caused its final rejection.

But within a very recent period a new science of heat has been developed, and it seems now to be firmly founded. The doctrines of the new thermotics are grand, comprehensive, and apparently in harmony with the universal facts of nature. The new science proclaims as a fundamental tenet the immateriality of the thermic agency. Previous theories, as we have seen, regarded it as something material, as a highly tenuous substance or matter. But the new view declares it to be not matter, but *force*,—an all-pervading, all-powerful natural force. Since, however, heat is only manifest in connection with or through the intermedium of matter, it has by some been defined as a property or an affection of matter. It is also maintained that the essence of heat is the motion of matter; not the motion of masses, not gross or sensible motion, but the motion or vibration of molecules. In the epigrammatic phrase of Tyndall, "heat is motion." That which we call heat, however or wherever manifest, however minute or stupendous its phenomena, is, in this view, the motion or agitation of molecules; and the intensity of heat is determined by the intensity or violence of this interstitial agitation. Heat and molecular motion seem, indeed, to be invariably coincident, but it does not of necessity follow that they are identical, that they are one and the same. It is quite conceivable that the former is the cause of the latter. But, however that may be, and whatever be the view taken as to the ultimate nature of heat or of its relations to matter, it must be regarded as a *force*; the most potent, the most pervasive, and as, indeed, the controlling force in creation.

The establishment of the dynamical doctrine of heat, though recent in date, has already revolutionized natural science, and it is destined to bear a leading part in future acquisitions, and to give impulse and guidance to scientific movement.

I have spoken of this doctrine as new. Its full recognition and its embodiment in the liturgy of science are, indeed, very

recent; but hints of it, ideas of it, are found far back in the annals of thought. We have seen that the ancients conceived it and taught it. Then, after the lapse of many ages, Bacon in 1620, Locke in 1690, Count Rumford in 1798, and Davy in 1812, distinctly announced it. Rumford and Davy, by ample experiment and by cogent reasoning, sustained it.

Locke said: "Heat is a brisk agitation of the insensible parts of an object, which produces in us that sensation from which we denominate the object hot, so that which in our sensation is heat is in the object nothing but motion." This, considering the state of science at the time, was remarkable language. Davy said: "The immediate cause, then, of the phenomena of heat is motion, and the laws of its communication are precisely the same as the laws of the communication of motion." But the caloric theory still held its ground. The growth of valid scientific principle is too often slow and halting; and so in this instance it is only within a few years that the new views have gained acceptance and supremacy. Grove, Mayer, Helmholtz, Joule, Faraday and Tyndall, a brilliant galaxy of names, have been chiefly instrumental in founding the new thermotics. By years of patient research, carried on in the true spirit and by the strictest methods of science, and animated by a single and sublime devotion to truth, they and their co-workers have lifted up a long neglected branch of knowledge, placed it on solid foundations and given it the rank in science which its superior importance demands. They have shown, by conclusive experimental proofs, which in this presence I need not recount, that heat is not a material thing; but rather that it is a force which acts upon and through matter.

The two great factors in creation are, therefore, matter and force. A few elemental matters and still fewer elemental forces, or possibly a single force, make up the wondrous drama of creation. These natural forces are heat, light, electricity, chemical action and gravitation. Exerted upon matter, they are the cause of all action, all phenomena, in the varied realms of nature. They are, indeed, the all-sufficient forces and powers with which God, in the primal hour, dowered the universe.

But brief reference must here be made to an important and far-reaching generalization of modern science; namely, the principle, now firmly established, of the conservation and the correlation of the natural forces. This great principle is the basis and support of physical and biological science. Conservation of force implies its indestructibility; it implies that the sum

or total quantity of force in creation is for ever the same and unalterable. It took man several thousand years to find out the simple and fundamental fact that matter is indestructible. When substance vanished from sight it was thought to have been destroyed, to have gone out of existence. When bodies were burned, or underwent decay or decomposition, and when fluids passed into invisible vapors they were thought, as they had disappeared, to have been destroyed and lost. On the other hand, when new substances or bodies appeared in the physical world, and when new plants and animals appeared in the organic world, it was thought that a new creation of matter had taken place. This great error, so fatal to progress in natural science, was not cleared away until the beginning of the present century. Then Lavoisier, whose labors are an epoch in science, demonstrated that matter can not be destroyed; that not one singe atom can go out of or come into existence. By the simple balance for weighing matter, for he was the first to employ it for the purpose now mentioned, he proved conclusively that when the products of combustion, as smoke, ashes, gases and vapor, are carefully collected and weighed, their total weight is precisely equal to that of the body which had disappeared by burning. So with respect to decay, decomposition and vaporization. In all these instances there is change of physical state, but no loss of matter.

But the equally great and important truth of the indestructibility of force has been recognized only within the past few years. It is now, however, seen, and has become an axiom in science, that the general fund or total quantity of force in nature is always and ever the same. There can be neither gain nor loss. As the sum total of matter is a fixed and immutable quantity, so is the sum total of dynamical energy; but the phase of force, or its mode of manifestation, is incessantly changing; and on this versatility, or ever changing mode of force, depend most of the phenomena of nature. One form of force passes or is resolved into another, this into another, and this again into another. Thus heat is resolved or transmuted into light, or into electricity, or into chemical action, [chemism] or into mechanical power, or motion of masses of matter, or into all of these one after another; or it may resolve or partition itself into two or more of the other modes simultaneously; becoming, for illustration, partly electricity, partly light, partly chemism, and so on. So electricity, light, chemical action and motion of masses, may each be resolved or transmuted into any of the other modes of force, or into all, one after another, or partly into one and partly into two

or more of the others. Beginning our observations with whichever force we may, we shall find that it is resolvable into any one or several of the others. We shall also find that these transmutations take place in any direction indifferently; that is, for illustration, heat may merge into electricity and electricity back again into heat, electricity into chemical action and chemical action back again into electricity, and so on through endless rounds. But in all instances, both in nature and in art, there is absolute conservation of force. When one force disappears or is resolved into another, the latter is the exact equivalent of the former; and if one force or mode of force is resolved into several others, the sum of the latter is also the exact quantitative equivalent of the former. If heat disappears some other phase or phases of energy appear in equivalent quantities, and a like statement is true concerning all the other forces. This reciprocal convertibility of force is expressed by the term correlation. A knowledge of it sheds a flood of light on the ways of nature, and makes plain phenomena, which, else, would be inexplicable. It means, simply, that all modes of natural force, except, perhaps, gravitation, are so intimately related, so essentially identical, that they are resolvable or transmutable into one another. A study of the phenomena of nature is but a study of these transmutations. Invariably and everywhere one form of force is derived from another form of force. In the measureless expanses of the universe, in the fields of the microscope, in the laboratory of the chemist, in the shop of the artisan and in the provinces of life, the great facts hold that force or energy comes from antecedent force or energy; and that force endures forever, without loss, without increase, but with ever changing phase. A thousand proofs and illustrations might be presented, but here and in this presence that would be a superfluous labor. The engine by which heat is converted into mechanical force or working power; the telegraph by which chemical action is converted into electricity and the electricity into motion of the keys; the Edison Light, in which electricity is transmuted into light, heat, and mechanical force; and the lightning flash, in which electricity, leaving the surcharged cloud, marks its path with a line of vivid light, and then, transmuted into mechanical power, rends the oak, or into heat, consumes the dwelling of man, these are a few familiar examples showing the correlation or transmutability of the natural forces. Incidental reference has been made to the convertibility of thermic force into mechanical or working power; but this quality is so important and has so much to do with phenomena in all the fields

of nature that a little further reference to it may be justified. It has recently been shown that an exact mathematical relationship exists between heat and mechanical power, and that a given quantity of either is convertible or transmutable into a definite and calculable quantity of the other. Joule, who will ever rank with the great founders of science, discovered and formulated the ratio. He found, after many years of patient labor and experiment, that a quantity of heat sufficient to raise one pound of water one degree in temperature will, when converted into mechanical force or power, lift a weight of 772 pounds one foot in height; or a weight of one pound 772 feet in height. Conversely, mechanical force sufficient to raise 772 pounds one foot in height will, when resolved into heat, raise one pound of water one degree in temperature. This mechanical equivalent of heat is a fixed and definite relationship,—a constant of nature. A definite ratio has also been found to exist between thermic force and chemical action. The burning, for example, of one pound of carbon,—a purely chemical action,—will devolve heat enough to raise about 8,000 pounds of water one degree and eight-tenths of a degree in temperature. Helmholtz, after explaining this mechanical equivalence of heat, adds: "All the other forces of nature are measurable by the same mechanical standard, and are all, as regards work, equivalent."

Joule's discovery is of incalculable value in science. It furnishes a dynamical unit, and gives greater exactitude to research. The artificial conversion of heat into mechanical force by means of the engine is familiar to all, but its vast practical advantages are perhaps not sufficiently considered. The useful work thus effected in manufactures, and in speeding ships across seas and trains across continents, is quite beyond estimation. But in all these instances man, though ever boastful of his triumphs, does not create one scintilla of force; he simply, by mechanical contrivance, makes a natural force subservient to him. By means of the engine heat is converted into available mechanical force or work. Additional mechanism may so *direct* and *distribute* the mechanical force thus derived as to cause it to do many different kinds of work and to yield many kinds of products. We have seen that it sends ships and trains on missions of commerce and civilization; but, further, it lifts great weights, it grinds wheat into flour, it saws logs into lumber, and it fashions wood, brass and iron into a thousand artistic and useful forms. The force in all these instances is heat. The kind of work it is made to do, the results it accomplishes, depend on the mecha-

nism through which it is exerted and by which it is directed. Here we come in sight of a fact or law of vast reach and of vast importance in the plan of nature,—a law which runs through the provinces of life as well as through the realms without life. We have seen that thermic force is resolvable into various other forms of force, and that by variety of mechanism it is made to do different and various work. If we follow the same force into the living world we shall find that, directed and distributed by various organic mechanisms, it does the various kinds of physiological work, or is transmuted into some, at least, of the actions and phenomena which characterize living organisms.

The sun is the original source of thermic force, the only fountain of that marvelous energy called heat which pervades the solar system, and warms and quickens our globe. Heat, wherever found and whencesoever immediately derived, comes in the first instance from the great orb which lights up the heavens and floods them with splendor. Combustion, friction, and other so-called sources of heat are only secondary sources. They do not create heat; they merely set free or reinstate that which the sunbeam had previously brought hither.

We come now to consider for a moment the biological bearings of the great theme. What are, and whence come the forces of life, the forces of the organic world? Are they the general physical forces of nature, acting through and directed by organic mechanisms? or are they a separate and distinct order of forces? In briefer terms, are physical and vital forces correlated? These are not only questions of the profoundest scientific interest, but they are inquiries in which medical men have the prerogative of a special concern. The high goal and the supreme duty of the physician are to gain, not merely a knowledge of the material structure of the animal body, but also the more important knowledge of the source, nature, and laws of the immaterial forces which rule the animate world. The true and, indeed, the only function of medical art, whether we recognize it or not, is so to direct and regulate these forces as to establish or restore that equilibrium which is health. Modern scientific research, with its experimental and inductive methods and its more perfect instrumental aids, tends, it can not be doubted, to show identity of physical and physiological force; to show, indeed, that the subtle energies which build up the plant and the animal are borrowed from, or are part of, the general stock of physical force. The principle of the correlation and conservation

of force, recognized first in the physical creation, has by further investigations been found to extend also over the province of vitality. The present state of knowledge and all additional research seem to show that the physical world and the vital world are under the dominion of the same forces and swayed by the same universal laws. Thus the poetic conception that

> —"the first Almighty Cause
> Acts not by partial, but by general laws,"

becomes also the conclusion of science.

In the investigation of organic or vital processes strictly scientific methods and scientific reasoning ought to be employed. In physiology as in physics, in pathology as in meteorology, the actual, concrete facts of nature are the only safe elements, the only solid basis of induction. All else is misleading.

I can touch but lightly the subject of the identity of vital and physical forces, and must be content with the merest outline of the argument. The matter of the organic world is the matter of the inorganic or physical world. Plants and animals are composed of matter drawn from the common stock of nature. Carbon, hydrogen, and nitrogen, which are simple, elemental, unliving matter, are the chief constituents of the most delicate, the most complex, and the most highly functionised living structures. Carbon, for illustration, is apparently the most lowly of the material elements; yet its career through the two great kingdoms of nature, the organic and the inorganic, the living and the unliving, is full of instruction and suggestion. It is the soot of our chimneys; the lampblack; the coal in which the untutored mind sees no history and finds no interest. But if we follow it a little further we find it in the diamond that glitters on the lady's finger, and in the marble which art chisels into enduring forms of beauty. A large part of the crust of the earth and of its teeming soil is composed of it. But more suggestive still, it is a large and an indispensable constituent of every plant and of every animal. Without it organic structures could have no existence. Indeed, as another has aptly said, "organic chemistry is chiefly the history of the transmutations of carbon." Is it reasonable or scientific to assume that carbon and other material elements, in thus passing from the inorganic to the organic state, part with or are divorced from the properties or forces which pertain to them in the physical world? Are they, while in transit, endued with new forces and new powers, separate from and independent of the ordinary

forces of nature? So far all observation and all research return a negative response to these inquiries, and seem to show that as all organic structures derive their substance from the ordinary materials of nature, so also do they draw their forces from the general forces of nature. Matter may enter into a thousand combinations and assume an infinite variety of forms, but it never loses its identity; neither does it part with any of its primitive properties, nor acquire new ones. Carbon, still using that element as a type of matter, is the same whether found in the dust of our streets, in the lustrous flower, or in the most highly vitalized viscus of the animal organism. Reasoning from these broad analogies it seems consistent to conclude that, as the same elemental matters run through and make up all the kingdoms of creation, so the same elemental force or forces pervade and govern them.

But the doctrine of the essential sameness of physical and biological forces does not rest merely on the argument of analogy, but founds itself also on the specific facts of nature. These teach us that neither plant nor animal can originate or create one iota of force or power, but that all its force is derivative; coming, not from super-physical or super-natural sources, but from the common fund of nature. In this view, the plant and the animal are organic mechanisms by and through which physical force is transmuted into organic or vital force. The plant is the link which connects the physical world with the animal world, and through which that dominating influence we call force is conveyed from the former to the latter. Heat is the form of force chiefly concerned in these processes. The plant draws its substance in part from the soil. But this material must be in a state of solution, and without heat this solution cannot be effected, Heat alone is the force which sets up the processes of capillarity and osmosis which are indispensable to nutrition. The seed cannot germinate until the sun's ray charges the soil with thermic force; nor can the plant without this force go through its regular evolutions of growth, inflorescence, and fruitage.

But the leaf of the plant is the chief organ or laboratory in which physical force is transmuted into organic force. The leaf drinks in or absorbs the wondrous forces of the sunbeam. The forces so derived decompose or break asunder the carbonic acid, the ammonia and the watery vapor which the leaf also takes up from the atmosphere. Portions of the products of these several decompositions are, by the presence and action of sun force, transmuted or lifted up into organic compounds. Here, in the leaf, the first step in organization is

taken; here inorganic matter passes into and becomes organic. Sun force, carbonic acid, ammonia, and water enter the leaf; but they do not all leave it, or rather they do not all leave the plant of which the leaf is an organ. They remain stored up in it as vegetable tissue, as organic compounds. These organic substances, now constituting the plant, are combinations of ordinary matter with the force taken by the leaf from the sunbeam. They hold in union the matters which the plant, through leaf and rootlet, has drawn from earth and air, and the force which the leaf has taken from the sun's ray. The sun's ray does not heat the green leaf or sensibly raise its temperature as it does other objects, for the significant reason that the leaf instantly converts or resolves the heat of the sunbeam into physiological force. It disappears as heat, but continues as organic force. Hence it is that leaf-covered forests have a cooling influence beyond that produced by the shade.

The plastic force of the sunbeam, then, is the moving cause of plant formation,—the force which, by transmutation, becomes the physiological force of the vegetable kingdom. Sun force and plant force are thus seen to be correlative. Some additional support for this view might be gained, perhaps, by adverting to the familiar fact that wherever the sunbeam falls, material conditions concurring, there is plant and animal life. In the tropics where the sun sends down its most ardent beams, all nature seems bursting into life; while, on the other hand, within the arctic zones where it doles out its feeblest rays, life is wanting, or is scanty and uncertain.

The force so derived from the sunbeam and so resolved into plant force remains stored up and latent in the plant compound so long as the latter retains its organic integrity. But destruction of the compound liberates this force. Combustion, decay, and every form of decomposition sets it free. In burning, wood and other vegetable substances thus disengage or set free the thermic and other forces originally taken from the sun's ray. This organic force on being thus liberated by the disintegration of the plant organism, may appear partly as heat, partly as light, and partly as other phases of physical force. But always and everywhere the force or forces thus unlocked and reconverted into physical forces are the exact quantitative equivalents of the force originally borrowed by the plant from the sunbeam. Here again the great law of the conservation of force is manifest. Every plant, every tree, every vegetable body on the earth is thus a union of matter, ordinary matter, with force, with physical force,

derived mostly or wholly from that great fountain, the sun. Our coalfields are immense repositories of the light and heat of the sun in past geological eras. If coal or wood is burned on the domestic hearth, the liberated force appears as the light and heat which impart so much of cheer and comfort. If burned under the boiler the liberated force first appears as heat, and is then converted by mechanism into mechanical or working power.

If plant substance of digestible quality be taken by the animal as food it undergoes change and disintegration, and its contained force thus freed goes to supply the forces of the animal body. A part now takes the phase of animal heat, a part becomes mechanical or muscular power, while other portions are transmuted into various other physiological functions. Here it may be repeated that the plant or the vegetable creation is the link which connects the physical world with the animal world,—the medium through which the marvelous influences of the solar ray reach the higher provinces of vitality and become their motive powers. The animal obtains all its substance and all its force from its food: It has no other resource. But it cannot live on inorganic matter; it cannot draw its substance directly from earth and air, nor its force directly from the sunbeam, as the plant does; but it must have as food organized matter, vegetable compounds, or animal substances which have been previously built up from vegetable compounds. The process of vegetation is but a preparation for animal life. The compounds it produces are, as we have seen, charged with energy drawn from the sun. This energy is latent so long as the compounds retain their organic integrity, but becomes manifest and active the instant they undergo any change of organization. When taken as food and subjected to the processes of organic chemistry they undergo change, disintegration; and their organic force is set free within the animal organism. The energies so evolved become in part animal heat, in part muscular force, while other parts are resolved into the various physiological or vital powers. So far as research has gone, so far as the eye of science can now see, this is the only source of the forces which rule in the realms of vitality; and so far the great doctrine of the correlation of all force gains credibility and support.

Pardon me, if I recur for a moment to the great office of the leaf in the scheme of creation. So important is it, and so replete with scientific interest, that the student of nature kindles with enthusiasm as his thoughts dwell upon it. It has been shown that the leaf is the portal by which the forces of

the inorganic, unliving world pass into and become the forces of the organic, living world. Over this portal nature holds her wand of transformation; and thus wherever forest or field displays its plumage of green there is the scene of some of the most wondrous transitions in creation. There physical force first becomes organic force, and begins that circuit of transmutations which comprise the life and the death of the plant and the animal. If we view the vast area of living foliage spread out over the earth, filling the valleys, mantling the plains, and creeping up the mountain slope, we still gain only a faint conception of the extent and grandeur of the transformations thus in perpetual progress. But in the end all the force which thus enters into the organic world returns from it and resumes its ordinary physical condition. The decay, the disintegration of organized bodies, is the process by which this return is effected. But in all these changes, whether in the upward or in the downward series, there is neither gain nor loss of force. As to total quantity, that has remained the same.

But in this train of thought we must remember one important fact: in order that physical force may become organic force the intervention and agency of organic mechanism are needful. There must be the organic germ through which physical force is converted into the living forces of the plant and the animal. The germ converts thermic force, material conditions being present, into the forces which cause the evolution of the plant and the animal. Without thermic force the germ is inert and lifeless. But we can not see the origin of the first organic germ. We touch here the limit of knowledge, and can only gaze wistfully towards the hidden things of God which lie beyond.

The thermic phenomena of the human body, in states of health and in states of disease, have great and special interest for medical men; but there can be no intelligent or philosophic comprehension of them without reference to the general principles we have passed in review. Animal heat is part of the universal force, and is subject to the same all-pervading laws of correlation and conservation. It is devolved or disengaged by the disintegration of organized substances. It may, within the body as well as out of it, pass or be transmuted into other forms of force, physiological or physical. The temperatures of disease are signs or indices of abnormal transmutations of the force thus derived. In hyperthermic diseases, for example, too much force takes the mode of heat, while there is proportional insufficiency in other modes of

physiological force. The hyperthermic states of fever and of inflammation are invariably coincident with deficient force of muscle or deficient force of the secreting organs.

But I can pursue the subject no further. It was my purpose to conclude this address with some discussion of morbid temperatures and of the uses and value of the clinical thermometer. But my theme has already carried me beyond reasonable limits. I will only add that, in my view, the study of the thermic phenomena of disease by means of the thermometer opens up a field of great promise. So far this field has been imperfectly cultivated. Joule devoted seven years of patient toil to the experimental study of heat in its mechanical relation. He was rewarded by the discovery of the law of the mechanical equivalent of heat already alluded to,—a law of signal value in science. The medical man who shall, with equal zeal and perseverance, devote himself to the study of the temperatures of disease will not fail to make discoveries of priceless value in pathological science, and will thus enroll himself amongst the benefactors of his race.

TWO CASES OF SEVERE INJURY, WITH OBSERVATIONS.

BY WM. FULLER, M. D., GRAND RAPIDS.

GENTLEMEN:—In reporting the following cases I regret that I omitted to keep a daily record while attending them. As they have, however, but recently occurred, I can vouch for the correctness of the report from memory, and my design is to illustrate some principles in the treatment of injuries, which, though not new, I hope that attention to them for a few moments may prove to be interesting if not instructive. I wish particularly to notice the effect of the administration of alcohol in traumatic fever, and also its effect upon wounds when given internally.

Wm. Lansing, a short, stout, healthy man of 24 years, sustained a severe injury of his foot while rising upon an elevator. The heel was caught under the floor above, while the toes resting upon the ascending platform the foot was crushed from end to end. He wore a strong boot, the sole of which was torn off, together with a slipper of the integument, including all below the maleoli down to the metatarso-phalangeal articulations, excepting a strip of integument about two and a half inches wide over the dorsum of the foot. The soft parts of the bottom of the foot were severely crushed and disarranged, the metartarsal bone of the great toe was fractured, all the metatarso-phalangeal joints were opened, and the heads of the bones projected below. The toes were quite movable as a mass from the rest of the foot, attached only by soft parts and integument above. The foot, and especially the toes, were blue and cold to the touch, and there could be little doubt that extensive sloughing must result from such an injury.

I was assisted by the advice of Drs. Shepard and Maxim of this city. The accident occurred at 9 A. M. of Feb. 10th, 1880, and it was concluded to make the patient as comfortable as possible until the afternoon, when it would be determined as to what should be done. I gave a hypodermic injection of morphine, placed the foot upon a level with the body, and together with the leg it was enveloped in warmed cotton wool, a warm flat iron being placed at a little distance from the foot in order to stimulate the circulation in it. The slipper of integument was replaced as a protection. At 7 P. M. the toes were warm and the circulation in the foot good. There was some pain. The flat iron was removed and the cotton reapplied.

11th. Circulation in the foot and toes well established. Slight tumefaction; temperature of the body 101°, pulse increased in force. It was evident that the slipper of integument which was attached to the ball of the foot in front, would slough, so it was cut across about the middle of the foot and removed, exposing the os calcis and the torn plantar fascia and muscles. A large quantity of blood and serum escaped as I separated the torn parts with the finger for the purpose of insuring free drainage. In the afternoon there was considerable pain and a bad odor from the wound. Whiskey was ordered in doses of 3 ounces every hour or two, according to the violence of the pain and fever. A pint was taken during the night which fulfilled the indications.

12th. A line of demarcation could be seen extending across the sole just behind the ball of the great toe. The sloughed tissues were removed as much as possible by the scissors, and the parts separated for free drainage. The raw surface was enveloped in carbolized putty spread on a cloth and retained by a loose bandage. Whiskey continued, or gin if preferred, as the quantity of urine was deficient and difficult to void. The same treatment was persisted in and in ten or twelve days the sloughing tissues had separated. The odor was strong and the dressings were changed twice a day. The amount of whiskey taken averaged one quart in twenty-four hours, the rule of administration being that he should take all he wanted, but to come short of feeling its effect upon the head.

The thermometer scarcely registered above 101°, and occasionally 102°. There was very little swelling of the foot at any time, and none at the ankle or above it. The appetite was fair and the tongue clean and moist. The plantar fascia, superficial layer of muscles, the tendon of the flexor longus pollicis and distal extremity of the metatarsal bone of the

great toe were removed by the sloughing process. The lumbricales and the tendons of the flexor longus digitorum were preserved. As soon as the wound cleaned and the deeper parts united, there was no tendancy to rise of temperature and the whiskey was stopped. The wound was now strapped with adhesive plaster supported by a bandage. Granulation progressed favorably until the bottom of the foot was well filled up and integument had formed on the edge of the wound, when grafting was commenced, and at this date, May 12th, it is entirely healed.

This man had been in the habit of drinking occasionally, and once during the time that the healing process was going on he drank a bottle of beer, the result of which was that the granulations became infiltrated and pale; twenty-five grafts died and it required nearly a week to bring the wound into a healthy condition so that grafting could be resumed. I was surprised in this case to observe that a portion of the plantar fascia which remained upon the inner side of the sole formed an island of integument without granulations first forming upon it, and that it sent out projections like those of true skin with which they united when they met. If this is sustained by future observation it may be important as showing that the coverings of internal parts are analogous to the integument of the body, and may throw some light upon the pathology of epithelial structures since they are also known to be affected by the same remedies which are useful in skin diseases. Moreover the observation has been made that eczema and cancer are in some way related, the former disappearing upon the advent of the latter.

July 19th I received a letter stating that he had cast aside his crutch and was walking about on a useful foot. This man had been placed upon the table at the time of the accident for the purpose of amputating his leg, as the severity of the injury gave so little prospect of recovery with a useful foot, taking into consideration also the risk to his life in attempting to save it.

Case 2. By the kindness of Dr. Johnson, our worthy President, I am allowed to report the following case in which I assisted him: John Lynch, aged 18 years, a tall, large boned, muscular boy with a thin white skin, blue eyes, light hair with very little on his body, denoting a constitution unable to sustain a severe shock or a continued strain, was injured March 19th, 1880, by the front wheel of the truck of a shunting engine passing over his left ankle. The foot and ankle were severely bruised and there was an open wound over the internal malleolus from which there had been considerable hemor-

rhage. Over the external malleolus was a large swelling containing extravasated blood. I saw him with Dr. Johnson on the morning of the 20th. There was some pain in the injury. A small opening was made over the external malleolus, and a portion of the extravasated blood removed. I saw him again on the 22d. The limb was swollen as far as the knee, the skin tense, and there was much pain, fever and general disturbance of the system. At the request of Dr. Johnson I made an incision about 2½ inches in length over each malleolus, and several others less in extent on the foot and leg. It was found that the maleoli were fractured, the internal into small pieces which were removed in order to give free exit of fluid from the joint. The finger could now be passed freely into the joint and the articular surface of the astragalus was visible for about ¾ of an inch in extent. The limb was placed in an elevated position upon a splint so that it might be lowered for irrigation. A pail of warm water was ordered to be gradually poured over the limb every half hour or so according to the presence of pain. Morphia was withheld except a powder at night, as the patient could not sleep well even when there was no pain. Pain was frequently relieved by slight changes in the position of the foot.

The swelling abated somewhat in the limb, but the fever persisted ranging at about 104° and over. The wounds were soon coated with lymph which organized upon them, and by preventing the escape of serum they were thereby rendered almost useless. This condition and treatment continued up to the 28th inst., when it was observed that a continuous high temperature had made a marked inroad into his vital powers. The pulse was rapid, with a short quick impulse; appetite poor; tongue coated white, and much prostration. A moderate amount of whisky had been allowed for the last two days, viz.: a table-spoonful every two or three hours. It was now thought that a mistake had been made in attempting to save the leg at so great a risk to the boy's life. However, it was decided this evening to administer a more liberal amount of whisky. Three ounces were given at 6 P. M., repeated at 7 P. M., and again at 8 P. M., with the effect of reducing the temperature from 104½° to 102° by 10 P. M., without causing any cerebral effects. A pint was left in addition, to be taken before 7 A. M. of the 29th, with instructions to stop short of producing symptoms of intoxication.

29th.—Morning temperature 101°. Had taken all the whisky, viz., one quart, and had felt no head symptoms. Appearance much improved. Pulse soft, moderately full and

dicrotus; dropped from 140 of yesterday to 120 to-day. Skin cool and tongue moist. By some oversight very little whisky was given in the forenoon, and at 3 P. M. his temperature was 103°. It was again repeated in larger quantity, so that from this time he took two pints on an average each twenty-four hours, with a diet of beef tea, milk, etc., and one-half grain of morphia at night for several days. There was a marked improvement in his condition as well as in the appearance of the limb. The wounds soon presented a healthy appearance, covered with yellow pus instead of the coating of lymph before described. Tumefaction subsided, except behind the ankle, where there was a collection of pus, which caused great pain until it found vent, which was about April the 2d. Occasionally there was much pain in the joint, which was relieved by a slight change of position, or a discharge from it of a serous fluid. Several pieces of bone were removed from time to time from both sides of the ankle. Water injected into one side passed freely out of the other side of the joint, but as this caused pain it was not practiced. The whisky was continued for nearly two weeks, until the deep sinuses were nearly healed up to the external wounds, the sloughed tissues removed, and the discharge healthy. The temperature seldom rose to 102°, and at this time it was 100°, with no tendency to rise, so that the whisky was gradually withdrawn and stopped altogether in three or four days. He enjoyed table fare, and his general appearance was very much better. All the wounds were healed except those on the sides of the ankle, which continued to discharge healthy pus with serum from the joint. Seven weeks after the injury the external wound was nearly healed, the internal was small, and the serous discharge from the joint had ceased.

May 12th. The foot and leg have a natural appearance. The ankle is a little wider than the other and he can move the joint freely without pain. He can bear considerable pressure upon the sole of the foot which he practices against the foot-board of his bed in order to accustom the foot to bear his weight upon it, and frequently during the day he suspends the foot to the floor until it gets red, and by friction is stimulating the capillaries to support the blood pressure when he comes to assume the erect posture.

Aug. 1st. The ankle is well, and is movable to a considerable extent; he can walk easily down hill but has difficulty in going up. There is no pain in walking, but a want of confidence. He has neglected to exercise the joint to the extent that he should have done, and as a consequence the foot cannot be

brought under his body unless he rests upon the ball of the toes. The foot, when the sole is flat on the floor, is in advance of the other, so that the heel is about opposite the ball of the great toe of the opposite foot.

The above were both very severe injuries, and the history and treatment will serve to illustrate some of the important principles of surgery. First among these is the *free drainage of wounds* which is the "sheet anchor" of surgery. I have made use of the adjective free because I have observed that many surgeons fail to fulfil this most important indication to the extent that is necessary for safe and easy recovery from even moderate injuries. The indication in all cases is to drain effectually in such a manner that no fluids may be pent up either in the tissues or in a cavity.

I do not fear an open articulation, peritoneum or arachnoid, but rather the results from retained fluids distending cavities and weakening their walls or being forced with difficulty through small apertures and undergoing the process of decomposition. In all wounds or punctures of articulations, if rest and such measures as are ordinarily employed to prevent inflammatory action have failed, I think that early free incision is a necessity, and before the synovial membrane is destroyed by the suppurative process which is sure to produce an anchylosis, whereas, if this membrane remains intact and the ligaments are not weakened by distension recovery is permanent and in almost all cases the movements will remain unimpared. Tumefaction and fever indicate defective drainage which should be insured by the separation of the bruised and torn parts to the bottom of the injury. Infiltration within the unyielding sheaths of nerves, analogous to intraocular pressure, compressing the nerve fibres is very probably the cause of pain and of tetanus, and these can be averted by those measures which relieve all the tissues of the burden of serous effusion. The effusion also by obstructing the circulation in bruised tissues is the cause of more extensive sloughing than would otherwise take place.

There is one point in reference to position to which I will refer: that is to the relief of pain by slight changes in posture as often as discomfort or pain is expressed, which prevents the necessity of too frequent administration of morphia. Warm water as a local application and by affusion, is more pleasant and efficacious than cold applications in the reduction of inflammation. I cannot speak too strongly against the use of cold water in the first dressings of contused wounds, while the general system is in a condition of shock, and the vitality of

the injured part is much depressed. No surer method could be adopted to destroy the vitality altogether than this. We should rather at first encourage circulation in the part by artificial heat, treat the injured limb as the body should be treated in shock, by gentle stimulation, to be followed by depressing agents as soon as action tends to rise beyond that which is normal.

Beside external heat, etc., the remedies which I prefer in shock are whisky and opium in small doses frequently repeated, regulating the dose and the intervals according to the degree of debility, viz.: very small doses at short intervals in a very weak state of the system. I think that I have observed in not a few cases that a large dose of a stimulant, as whisky or brandy, given in shock has produced a persistent vomiting from which a patient seldom recovered.

I said before that defective drainage of wounds was the cause of the inflammatory fever. And again it happens that the febrile action reacts so as to increase the inflammation, for with the increased heat of the body and accelerated circulation the hot blood is rapidly injected into the inflamed tissues, increasing the local action in them. Moreover, it is to be observed that in robust constitutions an effusion of lymph soon organizes upon wounds and incisions, glueing together alike into one mass the living and dead tissues, thereby preventing drainage and rendering incisions, made for that purpose, practically useless, and by closing sinuses large deposits of pus are pent up in deep parts, and boroughing are the cause of great mischief. The indications here are plainly to reduce the temperature of the body, and to obviate the formation of this obstruction to drainage.

Happily we possess in alcohol this two-edged sword, and though we are possessed also of other means, I shall dwell only upon this. Alcohol, like all remedies which have active powers upon the system, has its *primary* or small dose action, and its *secondary* effects in the larger doses, which are directly opposed to the effects of the first. The former only is a stimulant, and useful in shock, while the latter is capable of fulfilling the indications in inflammatory fever. Administered in large doses, say from one to two quarts in twenty-four hours, its antipyritic power is equal to quinine, and possesses the farther advantage of being more under control. Quinine must be given in a large dose within a short period, and its effect is persistant; but with alcohol the temperature can be regulated at pleasure, and the disagreeable effect of an over-dose is temporary. It is convenient, since with a thermometer in the hands of a

good nurse, she is quite as able as the surgeon to regulate the amount to be given.

It is astonishing to observe the large amount of whiskey that can be taken in a high fever without producing any sign of intoxication, and if any symptom of this state is produced it is a certain sign, in my experience, that the temperature is reduced.

The effect upon the wounds from its internal administration in large doses is of equal importance to the reduction of the fever, for by preventing the organization of lymph upon the wounds it becomes an auxiliary to drainage. Why this is so is to be observed in the first case above, where the healing process was arrested and the grafts died as the result of a drinking bout. Alcohol, in excess, injures the nutrition of all the tissues of the body, prevents organization, and especially in new formations, and I think that this use is capable of greater extension perhaps to the solution of diptheritic membrane, etc. The whiskey should be old. Most of that sold in shops has a burning taste and disagrees with the stomach. I think that the power to reduce fever is independant of drainage since I have witnessed the same effect in puerperal and other fevers. Other arterial sedatives may be given with the whiskey when necessary.

LITHOLOPAXY AND LITHOTOMY:

A REPORT OF EIGHT CASES OF REMOVAL OF STONE FROM THE BLADDER BY THESE METHODS.

BY H. O. WALKER, M. D., PROFESSOR OF ANATOMY AND GENITO-URINARY DISEASES IN THE DETROIT MEDICAL COLLEGE.

MR. PRESIDENT AND GENTLEMEN:—It is not my purpose in this paper to discuss in detail the relative merits of certain procedures for the removal of stone from the bladder, but rather to report a few cases that have come under my observation, and the results obtained from the methods used.

The most ancient method for cutting for stone is described by Celsus, and was really "cutting upon the gripe," and consisted in making a lunated incision, with the extremities of the cut pointing to the coccyx, and after pressing down the gut, making a transverse incision into the bladder. This operation was rarely performed upon any one younger than nine years, or after puberty. Sometime afterward this method was improved upon by cutting lower and to one side, and designated the "lesser apparatus." Marianus, in 1524, published another method, called the "greater apparatus," which, he says, was devised by his master, Johannes de Romains.

In 1697, Frere Jacques created quite a furor and reputation for cutting for stone in the hospitals of Paris. Mery and Dionis, who witnessed the operations and results, relate that many of the patients died, and that the operation was performed without any respect to a knowledge of the parts cut. Mr. Rau, of Amsterdam, first suggested and used a grooved

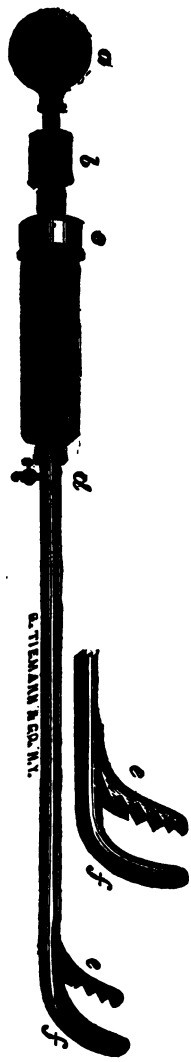
staff, for which improvement the operation was followed by wonderfully better results.

To Dr. James Douglas, who described the anatomy of the parts in a paper read before the Royal Society in 1818, we are indebted to the suggestion of the "high operation." It was not practiced, however, until three years after, when it was performed by his brother Mr. John Douglas, who had two successful cases. Others practiced it, including Cheselden, who regarded it as the best and most successful method at that time; but not being satisfied with the results (as the mortality was forty per cent), he devised what is now called the lateral operation, and in a report of two hundred and thirteen cases operated upon by him in St. Thomas Hospital, the death record was twenty.

Lateral Lithotomy, with modifications, continued to be the operation for the removal of stone until 1834, when Civiale introduced the proceeding that is denominated "lithotripsy" or "lithotrity," at the same time cautioning against the excessive instrumentation of the bladder. This caution has been strictly adhered to. Even Sir Henry Thompson, until quite recently, emphasized the fact that manipulation of the bladder should not exceed five minutes, and in the majority of instances limited it to three minutes.

Yet, in the face of these eminent assertions, Dr. Bigelow of Boston has demonstrated to us without doubt that the bladder is capable of prolonged tolerance of the judicious use of instruments. Litholopaxy or rapid lithotrity with evacuation has unquestionably lessened the field of Lithotomy to a great extent. The removal of a stone from the bladder at a single sitting without injury is a decided improvement over the old plan of repeated crushings. The plan is not new, for ever since the early days of lithotrity means have been used to wash out the detritus through a large catheter, and this again aided by suction such as Clover's bottle. Yet all these methods failed to evacuate, and were generally considered as useless. This new departure is meeting with a general acceptance and adoption by the profession both of this country and Europe, principally owing to the fact that the bladder *will* admit of prolonged tolerance of the use of instruments. Bigelow's set of instruments for the operation consist of a Lithotrite and evacuating apparatus. This particular set are not necessarily essential, for other gentlemen have attained the same results with other instruments, yet the idea is Bigelow's and to him alone belongs the credit of the procedure.

FIG. A.

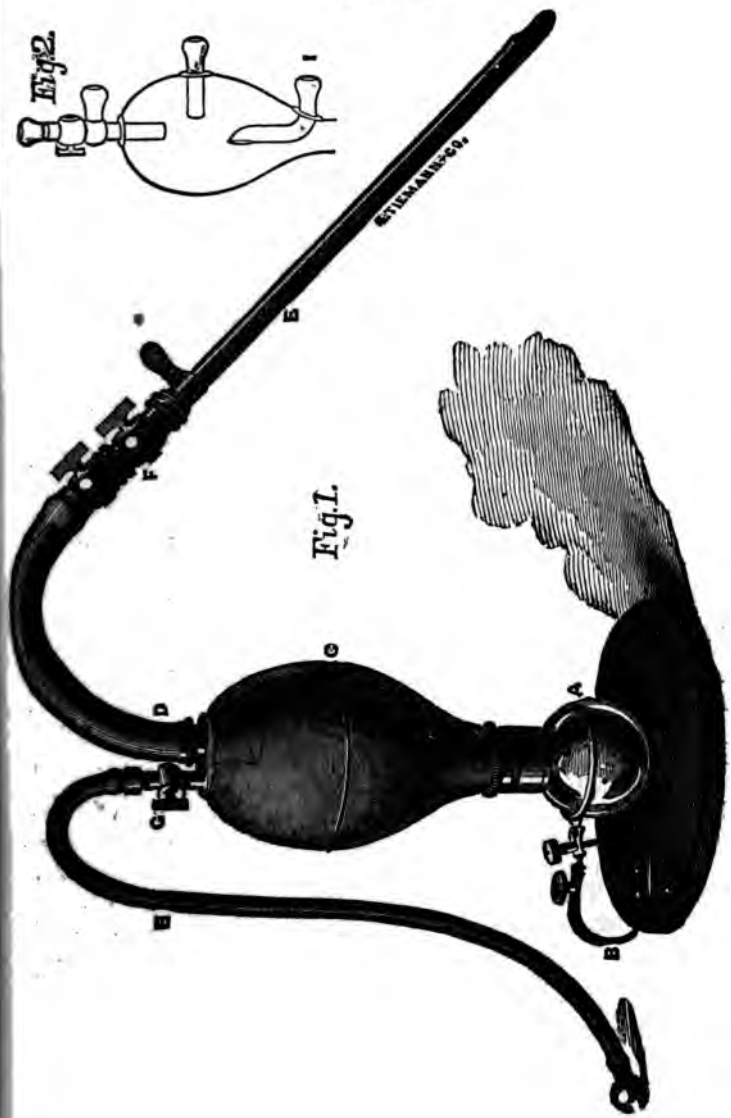


The Lithotrite, the one I exhibit you, (Fig. A,) is Bigelow's, and consists of a lock, wheel, or ball, injecting tube, and blades represented respectively in the cut. The blades, you will observe in this instrument, consist of a shoe or female blade, the sides being low, so that a fragment readily falls upon it. The small blade, or stamp, is serrated with triangular notches, alternating, being so constructed to form inclined planes, observing that it is much shorter and narrower than the female blade, thereby being next to an impossibility to nip the bladder. Dr. Keyes, of N. Y., at one time thought that this instrument must sometimes clog, but has recently gracefully retracted, by stating that the fault was in the improper construction of the instrument by the maker.

The Evacuating Apparatus (Fig. B) is a recent improvement on the one first described by Dr. Bigelow[1], and consists of, as you observe, a large rubber bulb, with a glass receptacle at its base fastened to a standard. To its upper part is attached a large rubber tube which may vary in length to suit the fancy of the operator, and to this is connected the evacuating tube by means of two stopcocks, to prevent the entrance of air or escape of water. It also has a smaller tube with stopcock attachment, for the purpose of filling the bulb with water, preparatory to washing out the bladder. This apparatus[2] is a decided improvement over the old one, inasmuch as it does away with having to fill the bulb by pouring in the water, and if it were not for contraction of the bladder at the time of manipulation of the instrument, allowing the escape of a few drops along side of either the lithotrite or evacuating tube, the operation would be essentially a dry one.

[1] Am. Journ. of Med. Sci., January, 1878.
[2] Boston Medical and Surg. Jour., January, 1880.

FIG. B.

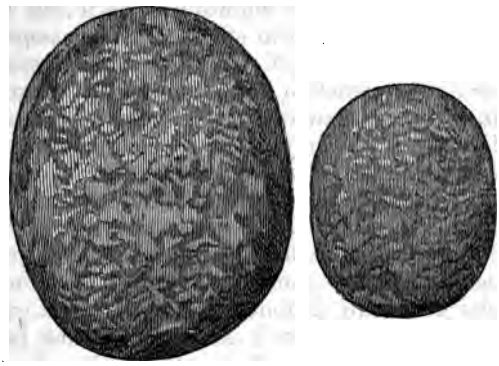


The report of the following cases speak for themselves:

Case 1, aged 51 years, came under my care March 13, 1875, through the kindness of Dr. J. H. Carstens. Bladder symptoms had existed for over ten years. Examination readily detected more than one stone of large size. No disease of kidneys, everything being favorable to the operation proposed, Lithotomy. March 20, '75, after preparatory treatment with diluent drinks and quinia, patient under the influence of ether, and staff introduced, I operated, assisted by Drs. Carstens, Oakley, and medical students. The first incision was made by plunging the point of the knife a little to the left of median raphé at one and a half inches anterior to the anal margin until it reached the groove of the staff, then cutting the urethra longitudinally about half an inch, and completing the cut by a free incision outward and backwards to a point near the tuberosity of the ischium. The second incision was completed by a probe-pointed knife, by cutting through vesical neck, and through prostate body about five-eighths of an inch at an angle of 80 degrees with the median line, and after several ineffectual attempts with the lithotomy forceps, it was evident that the opening was insufficient for the removal of the stone. I increased it by a similar cut through the right side of prostate, and without difficulty extracted the larger stone, and immediately after the lesser one. There was considerable hemorrhage, but readily controlled by compression and the shirted canula. After putting the patient in bed, gave him ten grains sulph. quin. and one-quarter grain of sulph. morph. I deem the quinine highly important in all genito-urinary operations, however slight, before and after the operation. March 21, passed a comfortable night. Pulse, 80. Temperature, 99°. Urine passed per urethra; removed shirted canula and ordered continuation of five grain doses of quinine three times a day. March 22. Pulse, 82. Temp., 99½°. Urine passed both through urethra and opening. March 23. Pulse, 78. Temp., 98°. Very little urine passed through opening. March 24. Pulse, 74. Temp., 98½°. No urine has passed through opening during last twelve hours. On the twelfth day after the operation, the patient was up pressing pantaloons, his occupation being that of a tailor. He continued to improve, and four weeks after the operation the wound was entirely healed.

Size of larger stone, 2 inches long, 1⅞ inches wide, and ⅝ inch thick. Small one, 1¼ inches long, one inch wide, and ⅜ inch thick. Phosphatic variety. Oval, compact, and almost smooth. (Fig. C.)

FIG. C.



Case 2, aged 63. Date of symptoms fifteen years. Came under my observation through the kindness of Dr. C. C. Yemans. Since the recognition of stone in the bladder, he had been operated upon both by lithotomy and repeated crushings without permanent relief. It was decided to operate by Dr. Bigelow's method, which was done July 5, 1878. Patient under ether, the fragments of stone were easily seized and crushed. After cutting the meatus (which may be necessary in certain cases in order to introduce evacuating tube) No. 29 F. evacuating tube was introduced and between 40 and 50 grains of phosphatic calculus were removed. Time of operation, one hour and ten minutes.

Case 3.—Eddie McG., aged 16 years, first had bladder symptoms two years ago. His physician, Dr. G. P. Andrews, first discovered the presence of stone April 18, '78, when he transferred the case to me. April 25, I used the lithotrite without the evacuating apparatus, removing about 20 grains. May 1st, used it again, removing 23 grains, after which there was a subsidence of symptoms, and general improvement. July 15th he again returned, and examination revealed the presence of a small calculus. July 15th, the patient being put under the influence of ether, I crushed and removed with the evacuating apparatus (using tube No. 30 F.) sixty grains of phosphatic calculus. Time of operation, one hour and twenty minutes. The operation was performed in my office, and after recovering from the anæsthetic he took the street car for his home. No unpleasant symptoms occurred. A reëxamination one week after failed to detect any fragments of stone. He continued to improve until August 15th, when he was suddenly attacked with great pain on micturition.

Examination revealed a small fragment of stone. Putting him under the influence of chloroform, as it was with great difficulty that he succumbed to ether at previous operations, I readily crushed and evacuated about 20 grains of stone. And as all muscular contraction was thoroughly relaxed by the chloroform, a further examination detected a large roughened surface high up and firmly attached behind the symphisis pubes, and after great difficulty I succeeded in dislodging it. At this sitting there were removed one hundred and fifty-seven grains. Time of operation, one hour and thirty-five minutes. Owing to the unpleasant and dangerous effects of the chloroform, I deemed further efforts at removal of stone unwise. Three weeks afterward I removed seventy-eight grains, and after repeated examinations I am satisfied that it is all removed. The nucleus of calculus proved to be very dense and hard, and of the lithic acid variety. Several pieces weighing over twenty grains came away through the evacuating tube. Had there been no difficulty with the anæsthetic, and a thorough muscular relaxation taken place, I am confident that the operation could have been completed at one sitting. There were no untoward symptoms whatever after any of the operations. Entire quantity removed, three hundred and forty-seven grains.

Case 4.—I. D., aged 70 years, has had difficulty in urination for about 25 years. July 22, at the request of Dr. Shurley, Dr. Kiefer and myself made an examination with Andrews' stethescopic sound (the patient under an anæsthetic). Had no trouble in detecting calculus. July 25, assisted by Drs. Shurley, Kiefer, Farrand and Wyman, I made an operation for lithotrity, using Bigelow's evacuating apparatus. Had great difficulty in introducing lithotrite, using evacuating tube number 29, which was also introduced with difficulty. Patient acted badly under anæsthetic, and had to desist from operation after 45 minutes, removing between 90 and 100 grains of phosphatic stone. Patient experienced great pain after operation, and gradually sank and died next morning at 7 o'clock. In the afternoon made a *post mortem* examination. Cutting down, it was observed that the tissues in the vicinity were quite adherent, the result of old inflammation, with an excessive amount of fatty degeneration of all the organs. Had no trouble in passing the fingers through the walls of the bladder. Both kidneys contained about a teaspoonful of pus. Prostate gland very much enlarged, measuring fully four inches in length and one and a half inches in thickness. There was also an old false pas-

sage through it, which had been evidently made larger by the lithotrite and the evacuating tube. Death in this case was from shock, consequent upon the operation. I might also add that the patient had been properly prepared for the operation. Whole weight of the calculi, 320 grains.

The origin of stone in this case was undoubtedly the enlarged condition of the prostate.

Case 5.—Johnnie C., aged 7, sent to me by Dr. Shurly, July 28, for examination. Placing the little fellow under the influence of chloroform, I readily detected a large urinary calculus. The mother stated that she had first noticed him having trouble in passing water about four years ago while living in Cheyenne, since which time it continued to grow worse, and at the date of examination the urine was passed involuntarily.

July 31, assisted by Drs. Shurly, Farrand, Bradley and Stewart, and several medical students, I performed the operation of lateral lithotomy. No untoward symptoms occurred, and the patient made a good recovery, so as to come to the office within three weeks after the operation. The involuntary passing of urine has improved considerably. Size of stone, 1½ by ¾ inches; weight, 240 grains.

In this case there was a reaccumulation of the phosphates, together with chronic pyelitis, to which the patient gradually succumbed, dying April 10, 1880.

Case 6.—Joseph S., aged 27, native of Detroit, German descent. Dec. 17, 1879, consulted me in reference to a bladder difficulty with the following history: Nine years ago had a chancroid at the meatus which lasted for three or four weeks. After healing there was considerable narrowing at the meatus, for the relief of which, it was cut. Seven years ago, he first observed difficulty in passing his urine, which gradually increased until about three years ago, when the act of urination became excessively painful and frequent, often attended with a flow of blood and pus. For the last two or three months he has been compelled to stop work. His habits are good. No hereditary history of any kind. His general health is fair. No great amount of loss of flesh. Appetite at times is voracious, and at all times good. The introduction of a No. 8 —— searcher readily detected a stone in the bladder. Dec. 18. Examination of urine revealed a large quantity of pus, spec. gravity normal, acid reaction, with no evidence of kidney trouble. Ordered Quin. Sulph. grs. v. three times a day, also to drink Bethesda water. Dec. 19. Examined him with Bigelow's Lithotrite without any difficulty.

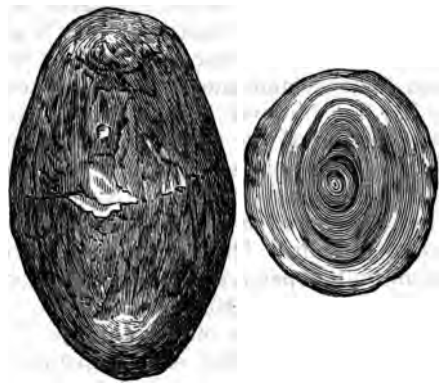
Diameter of urethra 29 m. Continued treatment, also saline cathartic next morning. Dec. 20. Assisted by Drs. Kaiser, Carrier, Conant, and medical students Messrs. Owen and Robbins, I performed the operation of Litholapaxy after the manner of Bigelow of Boston. Instrument used, Bigelow's lithotrite No. 27 Fr. First seizure, ⅓ of an inch, time of use 12 minutes, then introduced tube No. 29 Fr for 20 minutes, evacuating quite a large quantity of fragments. The prolonged evacuation was due to imperfect anæsthesia. The lithotrite was again introduced crushing a considerable sized fragment, and the aspiration again resorted to, making a thorough work. Time, from the commencement of anæsthesia until the completion of the operation, one hour and thirty minutes. Amount of stone removed, 287 grains. Patient rallied satisfactorily. There was at no time after the operation any chill or increase of temperature. The only difficulty that supervened was intestinal flatus, so much so, that on the 5th day after the operation I had to resort to an hypodermic injection of morphia, to relieve pain. This passed away before the end of the week, being benefited by enemas. Dec. 23d, I was called to see him, and found him suffering from herpes zoster of the right side, between the armpit and hip. Relieved in a few days by internal and external use of Tinct. Mur. Ferri. The after treatment in this case, was sulphate of quinine grs. 2 to 5 grs. 3 times a day. Also, Fl. Ext. Buchu oz. ss. Fl. Ext. Uva Ursa, oz. ss. Liq. Potasi, dr. iss. Syrup Tolu, q. s. oz. ii. Sig.—Teaspoonful every four to five hours. The strong ammoniacal odor of the urine gradually disappeared, and the patient readily held his urine from 2 to 6 hours, while previous there was a desire to urinate every few minutes night and day. January 16, '80, I examined him with negative results as to urinary calculi. He remarked that he had quite forgotten that he had ever any bladder trouble.

Case 7.—Willie L., native of Detroit, aged 16, first came under my observation January 3, 1880, through the kindness of Dr. Cleland, his history is briefly as follows: His mother states that when two years of age he fell from a table, injuring his back, and right after passed blood with the urine. From this time the mother dates the orgin of his troubles, and ever since there has been incontinence of urine, more especially nocturnal, attended at times with pain. During the latter part of last summer, or early part of fall, he passed one or more soft fragments. On examination with a small sized searcher, a vesical calculus was easily detected. Examination of urine, specific gravity normal, oxalates, pus. No

evidence of renal trouble. Patient's father died of consumption. He himself is inclined to pulmonary trouble.

Owing to small-sized urethra (measuring but 14 m.) in his case, the operation of lithotomy was the only procedure for the removal of the calculus. Jan. 14th, assisted by Drs. Cleland, Wilson of Rochester, Wyman and Inglis, also medical students Robbins, Boice, and Long, the patient under ether and prepared as the preceding case, I performed the operation of lateral lithotomy. Weight of stone, 570 grains. (Fig. D.)

FIG. D.



Phosphatic with nucleus of lithic acid.

January 15.—Patient rested comfortably during the night, with perfect reaction. No increase of temperature.

January 16.—Temperature in the morning normal, but in the evening rose to 102¼°. This, however, lowered again in a few hours.

January 17.—Temperature normal, and had passed a comfortable night, and is now in a fair way of recovery.

The after-treatment in this case has been citrate of iron and quinine, 2 grs. every 6 hours, with an occasional dose of 5 grs. of quinine. The incontinence has subsided, and his general health has greatly improved.

Case 8.—Alex. D., aged 45. Date of symptoms, over 25 years. July 28, 1878, he presented himself to me, giving the following history and symptoms: Has had difficulty in urinating ever since 16 years of age, and at that time it was discovered that he had congenital phymosis with a stricture at the meatus, for which he was operated upon, with relief only for a short time. The symptoms returned and continued with more or less severity until thirty years of age, when

he passed at intervals fragments of stone. Repeated examinations failed to detect calculus. For the last ten years the treatment has been principally mineral waters, and the occasional use of a catheter. On examination I discovered a stricture at the meatus, admitting only a bulbous sound No. 3 F.; passing it on I encountered an impassable point just in front of the "cut-off" muscle. This, however, I managed to pass with a No. 2 bulbous sound, when the instrument came in contact with a stone, and riding over it for about two inches entered the bladder. As his home was in St. Catharines, Ont., he did not come prepared to remain, but left, promising to return for treatment in a few weeks. For various reasons he did not return until Dec. 18, 1879. His condition then had become much worse, in fact he had not been out of his bed for over a year only a day or two at a time. Vesical tenesmus was severe, attended at times with rigor and fever, for the relief of which he had resorted to large doses of opium and quinine. Examination of urine revealed large deposits of ropy pus, albumen, and excess of phosphates were present. There were evident renal complications. Examination per urethram and by rectum revealed the presence of a large prostatic stone.

After vainly attempting to build him up, I explained to him the difficulties in the way of an operation, and as it afforded a possible chance of recovery he consented. This case only presented one procedure for the removal of the stone, namely, median lithotomy. The introduction of the lithotrite was an impossibility, and even if it had been, there would have been no room for its manipulation, as the stone was lodged in the prostrate.

Dr. Gouley reports the removal of a stone by Bigelow's method where there were strictures of the urethra, by first cutting the strictures; but in his case the stone was in the bladder.

February 19, 1880, assisted by Drs. H. C. Wyman and Casgrain of Windsor, Ont., I removed this large phosphatic stone I show you, which necessarily had to be broken before removal not only on account of its adherence but of its size. Its weight is two and a half ounces. He rallied nicely from the operation and passed a more comfortable night than he had for months. The next day in the afternoon the pulse was 120, temp. 102½°, and complaining of severe pain in the region of the stomach, with considerable nausea. These symptoms remained for two days, when they subsided with a normal temperature; there was, however, excessive exhaustion,

from which he never rallied, dying February 25th, '80. Post mortem examination twelve hours afterwards. No peritonitis. Removed the bladder, prostate, ureters and kidneys. The bladder was small, and contracted with walls half an inch thick, together with the prostate, it had the appearance of an hour-glass contraction. The ureters were greatly enlarged, easily admitting the introduction of the index finger. The kidney was small and contracted, with evidences of old abscesses. Pelvis of kidneys enlarged.

The source of stone in this case was congenital stricture of the meatus, as any interference with urinary flow long continued, is apt to be followed by vesical calculus.

These cases have been reported in the order of their occurrence:

Case 1 occurred before the days of rapid evacuation, and in accordance with the rules laid down for lithotripsy was too large a stone to attempt to crush, yet should a similar case present itself I should not hesitate to crush and evacuate, expecting good results.

Case 2 was a suitable and easy case for rapid evacuation, and was attended with decidedly happy results.

Case 3.—The boy aged 17 had an unusually large urethra for his age, and with other favorable conditions was a fit case for litholapaxy. There were some features that interfered with the evacuation at one sitting, namely, attachment of the stone behind the symphisis pubis, and the unpleasant effects of the anæsthetic, at the same time it must be remembered that the operation was in its infancy and that it was rather an exploratory and trial operation on my part.

Case 4.—The man aged 70 years, was a risky operation, whatever the method might be, both as to his general condition, and to the irregularity and enlargement of the prostate, and I am positive the cause of this man's death was the injury to the prostate with the lithotrite and evacuating tubes.

Case 5.—The boy aged 7, admitted only of lithotomy, owing to the size of the urethra, and as far as the operation was concerned, was satisfactory.

Case 6, aged 27, was a suitable one for Bigelow's method, and did well.

Cases 7 and 8, presented no other method than that of lithotomy.

Of the four cases operated upon by lithotomy, three recovered—one dying ten months afterwards with chronic disease

of the kidneys, and fourth died as the result of the operation. Of the four operated upon by litholapaxy or lithotrity with rapid evacuation, three made an excellent recovery, with no untoward complications whatever, and one died, as the result of injury to the prostate. In comparing the two methods of crushing, with and without rapid evacuation, it must seem to you that the one performed and accomplished at one sitting is decidedly preferable to repeated crushings and sharp fragments, not small enough to pass through the urethra, left to roll around in the bladder. The only question in the way—is the bladder susceptible of prolonged tolerance of manipulation? The data upon that point since Bigelow first published cases, are fully corroborated by the profession.

Dr. Keyes, in a paper on Rapid Lithotrity with evacuation, in the April No. of Amer. Journal of the Medical Sciences for 1880, says, in speaking of the statistics and mortality, that as far as he is aware, up to Feb. 15, '80, there have been one hundred and seven operations by this method with only six deaths. Bigelow in one case continued his manipulations three and three-quarter hours, and in one week after the patient was discharged well.

The points to be considered in this operation are:

1st. The selection of the case to be operated upon. This will depend upon the size of the urethra being sufficiently large to admit the passage of the evacuating tube, also upon the size of the stone to be crushed, and any stone that can be grasped by the blades of the instrument can be crushed. Cystitis is not necessarily in the way of the operation, for a number of cases, where cystitis has been extensive and of long standing, have terminated happily. It is to be presumed that all operators will take into consideration the general condition of the patient, particularly as to renal complications.

2d. A perfect knowledge of the anatomy of the parts, and the accustomed use of urethral instruments. Bigelow, Van Buren, Keyes, Gouley, and others emphatically state the operation should never be performed by any one not having these qualifications, and if no other opportunity presented, to practice it on the cadaver.

3d. The dangers attending the operation,—on injuries to the bladder and urethra. Injury, however, to the bladder is not of very great importance, as it will act nicely after injury when empty and at rest. But not so with deep urethra, for it is a marked fact that any injury to the membranous and prostatic urethra are quite often attended with unpleasant results. The reports of deaths after this operation are mainly

attributed to injury of the urethra, as revealed by *post mortem* examination.

The details of the operations are as follows: Perform, when possible, the operations upon a table of a convenient height; yet the apparatus is so constructed that it can be accomplished with the patient in bed. Two assistants are necessary,—one for the ether, and the other to attend to the washing bottle. Some operators prefer a quantity of water in the bladder before introducing the lithotrite. Some difficulty may be met with in keeping it in the bladder; this, however, can be done away with by applying a rubber band over the penis before introducing the instrument. Carbolated water is preferable, at a temperature of the body. The time of using the lithotrite will depend upon the size of the stone, and will depend upon the judgment of the operator,—probably 6 to 10 times opening and closing the blades will be sufficient. The evacuating tube is then introduced and attached to the rubber tubing and the connection established, when a gentle pressure is exerted upon the bulb, throwing the water into the bladder, and suddenly letting go the bulb when the sucking process commences, and the fragments will be seen to drop in the receiver below. This maneuver is sufficiently repeated until the fragments cease to drop, or the bulb ceases to expand. This may be due either to a large fragment or a part of the mucous membrane becoming engaged in the orifice of the tube. Changing the position of the tube, or a sudden pressure upon the bulb will be sufficient to displace it. It may be necessary to again introduce the lithotrite and crush the fragments that escaped the previous crushing. Occasionally these fragments, may escape the jaws of the instrument; and the maneuver, as suggested by Dr. Keyes, by turning the patient on his side with a full bladder, will roll the fragment or stone out of a pouch or sac, and permit of its being seized.

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